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M. Walter Pesman



THE GREEN THUMB

VOLUME 1, NUMBER 1

FEBRUARY - 1944

GREETINGS

We take pleasure in announcing herewith the arrival of our new publication, tentatively named The Green Thumb. It is meant to be a concise and practical source of information for Members of the new Colorado Forestry and Horticulture Association. New developments in gardening and forestry occur over night; we hope to share them with our readers. Especially stressed will be information that fits conditions of this Rocky Mountain Region. We need your co-operation.

THE BOARD OF DIRECTORS,
M. WALTER PESMAN, *President*.

ANNOUNCING THE FORMATION OF THE COLORADO FORESTRY AND HORTICULTURE ASSOCIATION

Many types of organizations in Colorado have the same general basic interest in horticulture and in nature. How to unite them into one group and to serve them adequately has been the problem.

The directors of the Colorado Forestry Association are recommending a broadening of the association for this purpose. Members will receive, at regular intervals, a bulletin similar to this one with interesting and up-to-date information.

It is proposed to hold at least annually a conference similar to those that have proved so successful in the nursery and florist associations. Distinguished scholars from sister States and recognized local authorities will give that type of **practical** information which every nurseryman, every florist, every gardener and every plant lover craves. The annual meeting will be held in connection with such a conference.

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Our first conference will be held on Saturday, February 26, 1944, at Humphrey's Memorial Auditorium, 16th and Lincoln. Details as to membership, etc., will be announced. The annual dues will be small. In order that you may be acquainted with the purposes of this association and the first program, we now quote excerpts from the **program of activities** that has been drafted for the new association, and the program that will be presented on February 26, 1944.

Program of Activities

1. Publication of a monthly or bi-monthly bulletin or news letter to members. This may include, among other things, practical hints on planting and cultivation; notes on interesting and new or little-planted varieties, including native plants; notes on pest and disease control; news items on current activities of the association and digests of committee reports; interesting news within our field of activity from other localities.

2. Publication of a number of educational leaflets on subjects in our field which would fill a popular need in this region. For example, an eight-page leaflet on street-tree planting would be extremely useful in many small communities, and could be furnished free to members and at cost of publication to civic organizations, garden clubs, and interested individuals other than members.

3. Take the initiative in promoting a Rocky Mountain Botanic Garden. This project has had the consideration of the Association for so many years that there is no necessity here to stress its importance. The ideal

arrangement would seem to be to have the City of Denver furnish the site and police the grounds as a unit in the city's park system, with the management of the institution in the hands of an independent organization, presumably with participation of one of the Universities.

4. Establish an office as headquarters of the Association and employ an executive on a part-time basis in order to give the needed continuity and drive to our activities.

5. Urge the resumption of the roadside development program on State highways at the earliest practicable moment. This work was interrupted at the beginning of the war. Public officials should be advised of the interest of such citizens' organizations as ours.

6. Investigate what preparations are being made for instruction and training in forestry and horticulture, or what training is already available, for ex-service-men and others who may wish to prepare themselves for work in this field. Cooperate with school authorities in extending such opportunities for education. Encourage the coordination of academic work with seasonal opportunities for practical work in nurseries, etc. Work for adoption in public school curricula of more nature study and elementary instruction in principles of conservation, with the object of creating in the younger generation an appreciation of forests, parks and plant life, and the need of conserving our natural resources.

7. Stimulate interest on the part of towns and cities to acquire and improve parks and

forests, plant street trees, and improve the grounds of schools and other public buildings, in formulating postwar improvement plans. Suggested cooperating agencies include women's clubs, junior chambers of commerce, Colorado Municipal League, county extension agents, State and county foresters. Leaflets on particular subjects, described in Item 2 above, should be useful in any concerted effort of this sort. In case there is a need after the war to take up the slack in employment by speeding up public work projects, it would be even more important that attention be called to the desirability of civic improvements of the type mentioned.

8. Make a study of the need for a system of State parks in Colorado. In recent years State parks have had a remarkable growth in many eastern and mid-western States and in California, and are also showing up in a number of our neighboring States. They are filling a need for recreation and for preserving places of historic or scientific interest which for one reason or another are unlikely ever to come under the control of the Forest Service or National Park Service. It is not presumed that this Association could do all the work required in securing action to establish a State park system, but an active committee could at least explore the general possibilities and needs. Considerable valuable information on this subject has already been assembled which would be immediately available in starting such a committee to work.

9. Formulate policies with regard to the extension of public forests in Colorado and the regulation of privately-owned forest lands. There are reports of localities where destructive practices in forestry or neglect are increasing erosion, danger from floods, effecting public water supplies and ruining fishing streams. Some of these problem areas are close to home, such as the foothill country near Denver and the Black Forest.

10. Strive to develop in all parts of the State a civic consciousness to work for the preservation of places of natural beauty and prevent wanton destruction of trees and other native growth. At the same time stimulate the planting of trees on privately-owned land, particularly on so-called waste lands along streams and other places favorable to growth. Even though such activity may be a special province of the Agricultural Extension Service and State Forester, can not this Association, as a citizens' organization, be of assistance?

11. Appoint a committee on legislation, to keep an eye on measures which might help or hinder the objectives of the Association and to report on its findings with a view to appropriate action by the Association.

12. Hold an annual institute.

A stamped addressed postcard is enclosed herewith. We request that you answer the questions thereon, sign it and drop it in the mails as soon as possible.

THE COLORADO LANDSCAPE

On the barren mountain slopes of Northern England and in their valleys the Scotch grow to be the sturdiest race of Western Europe. In the valleys of the Alps the sturdy Swiss maintained their democracy for centuries. The mountains and Fjords of Norway produced the hardy seafaring and mountain race of that country. Could it be that on the slopes of the Rockies and in their valleys will develop the sturdiest race of America? Who knows? Certainly sturdy races do not grow in tropical lands with sultry climates, nor on the rich seashore lands where the battle with nature requires no strength.

This is mere speculation. It does seem, however, that in this Rocky Mountain land a type of plant life has found a home which is sturdy enough to withstand the chills of winter and the wither of drouth. It seems, to me at least, that nature is adjusting its plant children here, with reduced spending facilities in a smaller leaf surface and with a greater sturdiness for work in its greater root activity. As time goes on, these qualities will become valuable assets in the commercial growing of plants and the Rocky Mountain land will fill an important place in furnishing the nation with sturdier trees and plants. It is already doing it with such plants as sugar beets, melons, celery, carnations, wheat and many other items.

The narrow valleys of Colorado have a type of landscape which is the opposite of the broad plains and level landscapes

of other parts of the nation. Add to this a type of plant life which is typically Rocky Mountain in character and you have what I believe is the present and the future of the Colorado Landscape. It is different. It dares the man from other states to understand it, to work with it successfully. Landscape and landscape design in this section must be understood to succeed. It requires not only intensive study of the region's plants, its climate, its ways of plant maintenance, but it needs more than that; it requires an understanding of the Landscape of the Rockies. It can be taught nowhere but here.

S. R. De BOER,
Landscape Architect.

Now is a good time to do what trimming or pruning is needed on your fruit or shade trees for several reasons; you are likely to have more time now, and the new growth will soon start and heal over places where cuts are made. Leave maples, walnut and birch alone until they are in leaf, as cuts made in them do not heal until growth starts and they lose much stored-up food when the sap drips out in spring.

It would be well for all of us to watch closely our Colorado Cedar (*Juniperus scopulorum*) this year for indications of the presence of the juniper aphid. They may be present early or late, and it does not take long for them to do a great deal of damage. A contact spray will control them, or a hard force of water from the hose will discourage them and help to correct other trouble that the tree might have.



THE ONESEED JUNIPER IS A WORTHWHILE NATIVE

The Oneseed Juniper, or Cherrystone Juniper (*Juniperus monosperma*), has, as would be expected from its name, normally but one seed in each berry. It is usually broadly conical, as in the illustration, but frequently has many stems and resembles a bush more than it does the conventional tree with a single stem. Although the tree is native to the southern part of Colorado, it is thoroughly hardy any place in the state, is drought-resisting and seems to be much less susceptible to pests than the more frequently used Rocky Mountain Juniper (*Juniperus scopulorum*). The Oneseed Juniper lends itself to shearing and for that reason can be utilized for a hedge. Because of its irregular, spreading shape, it lends itself to naturalistic plantings and other informal uses. Although it will eventually reach a height of 15 or 20 feet, it is somewhat slower growing than the other erect Junipers and for that reason does not get "out of hand" as quickly.

This valuable native plant is available at many Denver nurseries and should be employed more frequently than it is in home planting.

PROPER TIME TO START AN ARBORETUM

Here is the story of two brand-new arboretums, started at a time "when it couldn't be done." One is a small private arboretum, the forty-five acre Desmond Arboretum near Newburgh, New York—the other a pretentious 267-acre public arboretum, located in Seattle, and called the University of Washington Arboretum.

The plans for the Washington Arboretum were drawn in March 1936; in a way it is a "depression-child," the Works Progress Administration furnishing \$800,000 as a relief measure. The Desmond Arboretum was not really started until 1939, although it had a number of older native and foreign trees and shrubs when Senator Thomas C. Desmond started on his undertaking to grow all the native American trees and shrubs which will grow in Newburgh. For one thing he shipped in four specimens of the Giant Sequoia, balled and burlaped, from California. Added to the native species he has 174 of the more interesting and beautiful exotic trees and shrubs.

Of very great significance is the Seattle venture. Here is a tract of ground partly owned by the City of Seattle, under a perpetual lease to the University of Washington, partly owned by the State of Washington, developed to a large extent by Government funds (more than a million dollars has been spent on it), and run by a non-profit corporation, the Arboretum Foundation; membership is open to all who wish to help. The City has agreed to maintain roads and paths, light and water facilities and to police the tract.

The University of Washington accepted administrative control and has complete supervision, also carrying on scientific studies. The Foundation maintains an office, meets the bills, and looks after the publicity. In the first few years it furnished over \$11,000 through its activities.

Is it worth while? Arboretums are among the famous tourist attractions. Think of the Arnold Arboretum in lilac time, North Carolina in magnolia time; the University of Washington Arboretum is constructing a mile long Azalea Trail.

Kew Gardens carried on the rubber experiments which resulted in the plantations now in Japanese hands. The Arnold Arboretum has done much to introduce Far-Eastern plants into the United States.

What will the Rocky Mountain Arboretum give to the World? —M. WALTER PESMAN

NEW BOOKS

All those of the family of The Green Thumb will want to read (and reread) the new book by Harold W. Rickett entitled "The Green Earth" (The Jaques Cattell Press, Lancaster, Pa., \$3.50). It is a layman's guide to botany. It unfolds the wonderful story of the life processes in plants and shows how dependent all animal life is on the manufacturing of food by plants. It will give us all a new respect for the wonders and beauty of Nature. It is scientifically right but written in fascinating style.

"Shrubs and Trees for the Small Place," P. J. Van Melle. New York City, Chas. Scribner's Sons. \$2.50. (Contains a score card for 363 shrubs and trees.)

FOREST INFLUENCES

A lodgepole pine timber stand heavily cut produced 31% more water for stream-flow than an adjacent virgin forest of the same type. Of a total annual precipitation of 24.5 inches, 10.63 inches of water was available for stream-flow in the virgin forest and 13.88 inches in the heavily cut plots. These are

HOW DO YOU LIKE THE NAME of this bulletin? It seemed to be the best of many so far suggested. We would like a name which would immediately suggest Forestry, Horticulture and the Rocky Mountains or Colorado. The Green Thumb seems to suggest the one thing which binds all of us, of various horticultural interests, together. Let us have your suggestions as to name, character and contents of this new publication. We want it to be very much worth while and help to fill the long-felt need of a horticultural magazine for Rocky Mountain conditions.

If you are interested in Horticulture and growing plants from any angle—professional, or amateur—please take it as your personal responsibility to pass the word along to those you may know who might be also interested in the purposes of this new organization. Send names to the Secretary or to any Director and talk to your friends personally.

Wherever possible we should like to give notice in these pages of programs of interest to horticulturists, foresters and nature lovers. Notify the Secretary when you know of such a meeting being arranged.

some of the findings of an experiment that has been carried on during the past six years on the Fraser Experimental Forest, located on the St. Louis Creek near Fraser, Colorado, by the Rocky Mountain Forest and Range Experiment Station of the U. S. Department of Agriculture, Forest Service.

Twenty-five acre plots were installed all treated differently. In one plot all trees over ten inches in diameter were cut. The remaining plots were cut over to leave 2000, 4000 and 6000 board feet of merchantable trees per acre with one plot uncut as a check.

Winter storage of snow in a lodgepole pine forest increased in proportion to the intensity of timber cutting. Three seasons of measurement have established that an average of 7.60 inches of water accumulated in the snow on uncut plots before melting began, while 9.59 inches—an increase of 26 per cent—was found on heavily cut plots, from which all trees larger than 9.5 inches in diameter had been removed.

Dr. H. G. Wilm will tell about this and other findings in this experiment at the Colorado Institute of Forestry and Horticulture on February 26.

God in his wisdom put great peacefulness in trees. There tired eyes find welcome relief. Worn and weary nerves find rest. The sound of rain on the leaves is music, and the murmur of the night wind is a soothing lullaby.

—*Family Circle*

FORESTRY AND HORTICULTURE CONFERENCE**Denver, Colorado****Saturday, February 26, 1944****P R O G R A M****Forenoon—Humphrey's Memorial Auditorium, 16th and Lincoln**

9:00—Registration.

9:30—Annual Meeting Colorado State Forestry Association

9:45—What's It All About?

M. Walter Pesman, President Colorado State Forestry Association

10:00—Colonel Allen S. Peck, presiding

Water Conservation—How Forestry Aids Horticulture (with kodachrome slides)

Dr. H. G. Wilm, Forest and Range Experiment Station, Fort Collins

10:30—Trees in Landscape Design (illustrated kodachrome slides)

L. R. Quinlan, Professor of Landscape Design, Kansas State College, Manhattan

11:25—Recreation and Forestry—Conservation of Natural Values

Prof. J. V. K. Wagar, Dep. of Forestry, Colorado State College

12:30—LUNCHEON AT THE COSMOPOLITAN HOTEL, ROOM D

\$1.50 per person (tax included)

Panel Discussion on POSTWAR HORTICULTURE

Clayton Watkins, Discussion Leader

L. L. Kumlien and L. R. Quinlan will discuss the topic from two different angles

Afternoon—Cosmopolitan Hotel

C. M. Drage, State Extension Horticulturist, presiding

2:15—From Victory Gardens to Peacetime Horticulture

Prof. A. M. Binkley, Head of Horticulture Department, Colorado State College

3:00—Dwarf Fruit Trees for Colorado

Dr. Louis R. Bryant, Associate Horticulturist, Colorado State College

3:30—Evergreens, How to Grow Them and Where to Use Them

L. L. Kumlien, D. Hill Nurseries, Dundee, Ill.

*Discussions will follow each topic***NOTES:**

Our Colorado authorities are too well known to need an introduction. C. M. Drage graduated from Victory Garden County Agent to State Extension Horticulturist. Professors Binkley and Bryant are tops in Horticulture, Dr. Wilm and Wagar in Forestry. Clayton Watkins is President of the Colorado Nurserymen's Association. Colonel Peck made a record as Regional Forester.

L. L. Kumlien is the author of *Hill's Book of Evergreens*, and is an outstanding authority on Evergreens in the United States.

Prof. L. R. Quinlan is a leading authority on Landscape Architecture.

Membership in the organization \$1.00 and up includes admission to both sessions.

\$5.00 pays for a sustaining membership.

The Green Thumb

a Bulletin of

COLORADO FORESTRY AND HORTICULTURE



VOLUME I

April 1944

NUMBER 2

GARDENING BY THE MONTH

A VICTORY GARDEN MANUAL

By Chas. Drage, Colorado State College

Special Number

ISSUED BY THE ASSOCIATION
AND WIDELY DISTRIBUTED
WITHOUT CHARGE.

GARDEN



TO ENCOURAGE THE WAR-
TIME PRODUCTION OF FOOD
IN HOME GARDENS OF COLO-
RADO.

Published by

THE COLORADO FORESTRY AND HORTICULTURE ASSN.

The Colorado Forestry and Horticulture Association

is pleased and proud to make this contribution to the Victory Garden program of Colorado, as a special number of our publication.

In order to have **GARDENING BY THE MONTH** as one unit we are withholding all other material for the next issue. We are enabled to distribute this number in a 10,000 copy issue, free to Victory Gardeners. Distribution is being made through the Denver Public Schools, the Boy Scouts and other channels. Extra copies for your friends can be obtained from the Editor.

Our next regular issue will be sent only to members of The Colorado Forestry and Horticulture Association. If you wish your friends to enjoy the privilege of membership, ask them to send a five or one dollar membership to the secretary, treasurer or any board member.

We hope that the information contained herein will help you to raise a better Victory Garden, and to become a more efficient gardener. The purpose of our Association is to collect and disseminate correct information regarding horticultural practices particularly adapted to our peculiar Colorado climate.

MRS. JOHN EVANS, President

GEORGE W. KELLY, Editor

"Gardening By the Month"

By **CHARLES M. DRAGE**

Extension Horticulturist, Colorado State College of A. & M. A.



Foreword

The Victory garden is an important unit on the "home front." It is not enough to hold the line. You will want to push forward. Gardening offers you unlimited opportunities to use your ability and skills.

No one thing is responsible for the success of your garden. However, the most important single factor is you. Your knowledge, your ability to "learn by doing," and your natural and your acquired ability to work with nature, all of these combined will determine the amount and quality of the family food supply you will produce.

You are challenged to produce more and better garden vegetables. Vegetables which are rich in vitamins, minerals, and roughage necessary in maintaining normal health.

This bulletin has been prepared to assist you. Study it carefully. Put into practice the suggestions offered. The more food you produce and consume at home the less food will have to be purchased, thus leaving more for the armed forces and our allies. Make your garden the best garden in your community.

Kind and Size of Garden

The size of your garden should be determined by the site, space and time available, and the needs of the family. Other factors to be considered are fertility of the soil, amount and source of irrigation water available, and abundance of sunlight. Approximately 1,000 sq. ft. of garden is sufficient to provide all of the vegetables required by one person for one year. Small gardens will supply a surprisingly large amount of fresh vegetables. The smaller the garden the more it should produce per square foot; therefore, the soil must be more fertile, the rows and plants must be closer together and each individual plant must receive better attention. Larger gardens enable the gardener to use labor saving devices and rows may be spaced further apart. Small gardens demand that those varieties be planted which will give the greatest yields of vitamins and minerals. Tomatoes, beans, carrots and vegetable greens should be found in the smallest gardens. As the garden increases in size a greater variety of vegetables may be planted. Crops not quite so important in the garden will also be planted in the larger gardens such as beets, turnips, cabbage, peas, corn, cucumbers, squash, potatoes and pumpkins.

For convenience gardens may be classified as: 1. Small Kitchen Gardens. 2. Large Kitchen Gardens. 3. Family Gardens. 4. Farm Gardens. In which group does your garden fall?

1. Small Garden: 100 sq. ft. to 625 sq. ft. This garden is usually found on a town or city lot and the space used may have previously been waste or in flowers or grass. Usually there is no opportunity to select the site or place. This garden gives the grower the opportunity of attaining near perfection. The

soil can be heavily fertilized. Every inch of space can be utilized. Every plant can receive individual attention. Insect and disease damage can be held to a minimum and not a single weed need be allowed to grow.

The small garden should include those crops adapted to your conditions and the crops your family likes, which will produce the greatest amount of vitamins per square foot; mustard greens, spinach, beets, turnips, when the tops are used; tomatoes, broccoli, carrots, cabbage, and string beans.

2. Large Kitchen Garden: 625 sq. ft. to 2,500 sq. ft. A garden of this size is still an intensive garden. Besides furnishing a plentiful supply of the more important vegetables for summer use some products may be canned, stored or dried for winter use. Corn, potatoes, cucumbers, squash, cabbage and other similar crops may be found in this garden. Perennials such as asparagus, rhubarb and strawberries may also be added to the crops produced if the site is permanent.

3. Family Size Garden: 2,500 to 5,000 sq. ft. This also is an intensive garden and it is one which requires a lot of work. Results can be more than satisfying. As we approach 5,000 square feet we reach a size which will produce all of the garden vegetables and fruits required for a family of four or five. The wheel hoe and seed drill are highly desirable pieces of equipment for the family size garden. They will save much time and labor, will do a good job, and will add greatly to the pleasure of gardening.

4. Farm Gardens: 5,000 sq. ft. to $\frac{1}{2}$ acre. The farm garden should be planned with the spacing needed to permit the use of horse or tractor tools. Rows should be long with

plenty of distance at the ends of the garden to permit turning. Some crops, such as sweet corn and potatoes, may not appear in the farm garden but may be grown in the fields where they can be more easily cared for. A great deal of care should be exercised in selecting the site for the farm garden and in fertilizing and preparing the soil. Preferably, the site should be as near the kitchen as possible,

but more fertile and warmer soils should not be overlooked because at a little greater distance. Gardens located farther from the farmstead often have natural protection from the farm poultry flock. A farm garden should be fenced to protect it from livestock and poultry. In irrigated areas, irrigation water should be readily accessible at all times.

Choosing the Site

You may not have much choice as to where your garden will be located, but the following will help you to understand what conditions are needed for plants to grow well.

The land should be level or gently sloping toward the south or southeast. It should not be too steep, for then it will wash. High ground is less susceptible to frost injury. The soil should be deep; a dark, sandy loam is preferred. It is important to know that enough

water is available and that it can be easily used. A minimum of five hours of direct sun is required each day for a successful garden. Do not attempt to grow a garden where a fill has been made of cinders, broken bricks, or where large trees shade the garden crops and steal plant moisture and food from them. Do not attempt a garden on seepy soil or where gravel or rocks are just a few inches below the surface.

Planning the Garden

The garden should be planned on paper first. It is much easier to destroy a row of undesirable vegetables with an eraser than with the hoe. Do not plan to plant the entire garden all at once when the "spring urge" gives you untold ambition. Plan for an early garden, plan for a canning garden, and plan for a storage garden. Garden planting starts in March and will extend through July. A good rule to follow when starting to lay out a gar-

den plan is: plant first things first and plant them close to the kitchen door. As the season warms up proceed across the garden with the last plantings. Care must be taken not to plant corn or pole beans where they will shade other crops.

The first garden planned for a new site can be arranged for beauty as well as a balanced production. After the first year crops should be rotated and planning for beauty becomes less possible.

Garden Calendar

Dates are only approximate

JANUARY

1. Look over seed catalogs. Decide on varieties recommended for your community. Order seeds.

2. Get material ready for the construction of shallow flats, and

hotbeds and coldframes for the larger gardens.

3. Locate organic material, compost or manure, for the garden. This may be piled in small piles to be spread later and plowed under

if garden has not been fall plowed.

Varieties—

Varieties of the principal vegetable crops are recommended by your State Agricultural College and your County Agent. These usually will do better than other varieties you might select. They may be resistant to certain diseases occurring in your locality, and their structure and adaptability may favor your growing conditions. The use of recommended varieties will generally result in bigger yields of high quality and greater uniformity may result.

Growing Plants—

Garden crops such as cabbage, tomatoes, pepper, cauliflower, egg plant, broccoli, celery and head lettuce may be started inside and transplanted later.

You can produce good plants and you can make sure you will have the variety you want by planting the seed and growing the plants. There are many methods and combinations of methods used in plant production. Shallow flats, bands, pots, hotbeds, and cold frames and various combinations of these methods may be used to produce hardy and healthy plants. For the family-garden "flats" are perhaps the most satisfactory.

A "flat" is a shallow box. A common size measures 3 or 4 inches deep by 12 by 15 inches. Drainage is provided by holes or cracks in the bottom. A good soil for the flat may be made by mixing together one-fourth sand, one-fourth well rotted manure and one-half good garden loam. If well rotted leafmold or compost is on hand this mixed with one-third sand is one of the best soils to use in flats. A soil too rich is undesirable; it must have organic matter to provide plant food and to hold moisture and must be loose to allow the roots to penetrate and to make it easy to work.

Firm the soil by packing lightly, then mark into rows using a straight edge. Make the rows one-fourth inch deep and one or two inches apart. Plant the seed about one inch apart, barely cover and firm the soil lightly. Sprinkle the flat carefully with lukewarm water. Keep the flat at room temperature. After the seed has germinated, place the flat in a sunny location. Water and turn the box every other day so that all the plants will get an equal amount of sunshine. Do not water too heavily. It is a good idea to cover the flat with paper after seeding and keep it covered until the seedlings break through the soil.

The first leaves to appear are not true leaves. When the young plants show their first true leaves they should be thinned carefully and those removed transplanted to another flat. Many times paper pots, paper cups, bands or berry boxes and even tin cans are prepared and placed in the second flat and the plants transplanted to these containers. Be sure the containers have drainage.

Amount of Time Required to Grow Plants from Seed Until Ready to Plant in Field

Onions—10 to 12 weeks.

Peppers—8 to 10 weeks.

Eggplant—8 to 10 weeks.

Celery—8 to 10 weeks.

Tomatoes—8 weeks.

Cauliflower—6 to 8 weeks.

Cabbage—6 to 8 weeks.

Lettuce—4 to 6 weeks.

Kohlrabi—4 to 6 weeks.

Broccoli—4 to 6 weeks.

Time of Planting in Garden—

Because of the great variation in seasons over the state, definite dates for field planting cannot be given for Colorado. Consult with local people who know. The following dates are usually considered safe and are given as a guide. However, seasons vary tremendously

from year to year and there may be a great difference in the dates of killing frosts in the same general locality. Safe dates:

April 25—Grand Junction.

May 1—Pueblo.

May 5—Canon City, Lamar, Holly, Rocky Ford.

May 10—Denver, Boulder, Las Animas.

May 15—Cheyenne Wells, Burlington, Akron, Montrose, Wray, Colorado Springs, Longmont, Greeley, Sterling, Fort Collins.

May 20—Julesburg, Delta, Cedar-edge, Holyoke.

May 25—Limon, Calhan, Rifle.

June 1—Grover, Glenwood Springs.

June 5—Dolores, Durango, Monument, Collbran.

June 10—Salida, Alamosa, Saguache.

June 15—Ignacio, Manassa, Buena Vista.

June 20—Meeker, Estes Park, Aspen, Hayden, Victor.

Tender plants like tomatoes, eggplant and peppers cannot be safely planted until long after the half hardy plants, such as cabbage, lettuce, cauliflower and celery.

FEBRUARY

1. Order seeds if you have not already done so.

2. Make or repair "flats," hotbeds and coldframes.

3. Make garden plans on paper.

Planning the Garden—

This month you should decide where your garden is going to be, how big it will be, and what kinds and varieties of vegetables you will plant. How much of each kind of vegetable should be planted? The whole family should go into conference on these important questions. A good garden will provide toma-

atoes, leafy, green and yellow vegetables for summer use and canning. It will provide cabbage and root crops and potatoes for winter storage, if of sufficient size.

Do not plant vegetable varieties not adapted to your community or disliked by the family. Vine crops such as melons, cucumbers, squash and pumpkins are warm season crops and will not do well at high altitudes where nights are too cool. Peas, root crops, lettuce, cabbage, cauliflower and spinach enjoy cool nights. Make sure your growing season (the period between the last killing frost in the spring and the first killing frost in the fall) is long enough to mature the varieties you are planting.

After all these details have been decided, plan your garden on paper. This planning makes it possible to arrange your space so that it can all be utilized. Measure the space you are going to use for your garden, then with a ruler and sharp pencil, map it out on a heavy wrapping paper. Use a scale of one-eighth or one-quarter inch for each foot. Where horse or tractor garden tools are used, run the rows the long way of the garden if it is possible to irrigate this way. The rows in a small hand-cultivated garden should run north and south if possible. Now decide what, when and where the vegetables are to be planted and draw the rows to scale on your map.

Your first map probably will be changed several times but it is much easier to change on paper than in the garden. When the plan which suits the family best has been decided upon, copy it very neatly and refer to it often. The sample plan following may be of assistance to you.

12 in.	Radish then L. Lettuce	L. Lettuce then Onion Sets	Onion Sets then Radish	March
24 in.	Peas First Planting followed by Bush Beans			March
24 in.	Peas Second Planting (2 weeks after first) followed by Bush Beans			March
24 in.	Early Cabbage 12 plants		Spinach	April
24 in.	Carrots followed by Turnips.	Dry carrot tops and use for seasoning. Use turnip thinnings and tops for greens.		April
24 in.	Turnips followed by Carrots.	Late Turnips and Carrots for winter storage.		April
24 in.	Spinach followed by Carrots			April
24 in.	Table Beets followed by Swiss Chard			April
24 in.	Bush Beans followed by Celery, 60 Celery plants			May
24 in.	Bush Beans planted 2 weeks later or potatoes			May
24 in.	Cabbage, 12 plants	Broccoli, 6 plants	Peppers, 6 plants	May
24 in.	Tomatoes staked, 12 plants			May
(1/4 inch equal 1 foot)				W S N E

MARCH

1. Treat all seeds, where treatment is recommended, before planting. Treat by putting a pinch of the seed treatment in an envelope with the seeds then seal the envelope and shake it a few times. Pour treated seeds out on paper and separate from excess treating material before planting.

2. Seed tomato, cabbage, pepper, celery, etc., in flats in the house or in hotbeds outside. Take care of the plants.

3. If the season permits, you can prepare your soil for planting. Make a good seed-bed and plant early cool season crops such as peas, lettuce, radishes, onion sets and spinach.

4. Study the latest information on gardening, especially on insects and disease control and order your insecticides.

Preparation of the Garden—

Most garden land will be plowed this month. However, if the soil is quite heavy it would have helped if it had been plowed in the fall. Perhaps you are spading your ground. Whatever the method used to turn the soil, be sure to turn it deeply. Many successful gardeners turn the soil in the fall and again in the spring. A liberal application of organic matter, such as rotted barnyard manure, chicken or rabbit manure, spread evenly and turned under will give excellent results. Use barnyard manure at the rate of one pound per square foot. Use poultry and rabbit manure at the rate of one pound for every ten square feet. Manures or compost may be supplemented with commercial fertilizer. One pound of superphosphate can be used to each 100 square feet of garden space (one-fourth pound to each bushel of barnyard manure or compost). Most Colorado soils are well balanced with plant food but the addition of organic matter

loosens the soil and lets the air in and improves the moisture-holding capacity. A healthy growth of weeds or grass the year before usually means the area will produce a good garden.

When you are plowing or spading do a neat, clean job. Keep the clods and large chunks of dirt on top. Spade or plow at least six inches deep, ten inches is better, but be careful that very little new or unfertile subsoil is brought to the surface. Carefully remove chunks of sod, rocks, large roots and other rubbish.

The newly turned soil should be raked or harrowed immediately while it is still soft and full of moisture. Rake or harrow in several directions. Level and firm the seedbed until it is finely pulverized to a depth of several inches. A rake with curved teeth is better than straight teeth for pulverizing, and the back of the rake can be used to level the surface. A loose, cloddy surface will result in poor germination and a loose, cloddy sub-surface will retard plant growth and it will cause root crops to be poorly shaped.

APRIL

1. Plant beets, carrots, lettuce, onions, parsnips, peas, early potatoes, radishes, spinach and turnips this month.

2. Transplant to the garden early cabbage, cauliflower, broccoli, head lettuce, kohlrabi and onion plants.

3. Apply cutworm bait if cutworms are present. Protect transplants with tar paper discs or paper collars.

4. Transplant or thin plants in flats or hotbeds. "Harden off" all plants, except tomatoes, by reducing water supply and temperature and by increasing ventilation. During the day covers may be lifted on hotbeds and cold frames and

flats may be set outdoors. "Harden off" gradually.

5. Enter or enroll in available garden contests.

Transplanting to the Garden—

Plants which you have produced should be carefully transplanted. Follow these simple rules:

1. Select a cloudy day or plant in the late afternoon or evening.

2. The soil around the plants in the hotbed or flat should be well moistened before transplanting. Keep as much soil on roots as possible during moving, and do not let roots dry out.

3. Set plants slightly deeper than they were growing in flat and do not cramp roots. Large tomato plants should be set in a slanting hole with only five or six inches of the top exposed. The slanting hole prevents placing the roots too deep where the soil may be extremely cold.

4. Transplant to a moist soil if possible. Firm the soil tightly around plant roots.

5. Water each plant after it has been set. Place dry soil around plant after water has soaked in.

6. Break off one or two of the older leaves, except on cauliflower, celery and head lettuce, to reduce evaporation. If possible, shade plants from sun for two or three days.

7. Dip the tops of all plants, except lettuce, with a solution made by mixing two tablespoons of arsenate of lead or cryolite and two tablespoons of wettable sulfur to one gallon of water. Keep dip off of roots.

8. A starter solution applied immediately around the plants after transplanting may increase growth and yield and will assist the plant in becoming established. Complete commercial fertilizers available for food production will prove satisfactory. Use at rate of one-half pound to five gallons of water. Use one

pint of this solution to each plant, taking care not to pour it on stem and leaves. Liquid manure, made by soaking solid manure in twice its volume of water, also is a good starter.

Seeding—

A garden line, a yardstick, a hoe, a rake and some small stakes to mark the ends of the rows are necessary seeding equipment.

Make your garden line by attaching each end of a fairly heavy twine to two sharp-pointed sticks. Make the line as long as the length of the garden rows. When not in use keep it wound around the sticks. A pointed broom handle from a worn-out broom will make two excellent stakes.

Set your garden line parallel with one edge of the garden. Use a yardstick to measure the distance from the edge of the garden to the first row and where your line will be located. The yardstick is also used to get the desired planting distance between rows and to keep the rows parallel.

Make the rows straight. Make the seed trenches as narrow as possible by following the garden line with the end of the hoe handle for small seeds and the corner of the blade for larger seeds. Follow your garden plans and the planting table to see what seeds to plant and the depth to plant. Do not make more than one trench at a time before planting. Cover seed immediately to prevent the soil from drying out. Press the damp soil firmly around the seed by tamping lightly with the back of the hoe or rake, then carefully spread a thin layer of fine loose soil over the row. The back of the garden rake used lightly is useful in this operation. Don't plant too deeply and don't plant in a dry soil. Remember, moist soil must surround the seed to insure germination. In all seeding operations you will find it helpful if

your seedbed has been properly prepared. A moist, fine layer of earth to receive the seeds will pay well.

Radishes may be planted with slow germinating seeds and small seeds such as carrots, onions, beets and parsnips so that the row will appear quicker, making early cultivation possible. Using the radishes when ready for table leaves a thinned row. Mulching the row proper with lawn clippings, well-rotted sawdust or sandy compost will also aid in germinating seeds slow to sprout. These mulches, however, may attract cutworms.

MAY

1. Transplant tomato, celery, eggplant, pepper and other plants not transplanted in April. Plant beans, corn and vine crops and make second plantings of peas.

2. Start cultivation, weeding and thinning. Start hilling potatoes.

3. Watch for insects. Flea beetles, aphids, cabbage worms, grasshoppers, cutworms and radish and onion maggots may appear this month. Apply control recommendations when they appear. Ten days after tomatoes are transplanted apply psyllid control as recommended. When potatoes are four to six inches tall apply psyllid control. Repeat psyllid control every ten days to two weeks on tomatoes and potatoes.

Cultivation, Weeding and Thinning

Get an early start on weeds. Work well done this month will save a lot of work later on. Every weed that grows robs the soil of plant food and moisture.

Thinning is usually necessary. Just as soon as the plants have their third or fourth pair of true leaves developing, or as soon as they can be distinguished from weeds they should be thinned. At thinning time all weeds in the row and for an inch or two on either side should be removed by pulling.

In thinning, try to leave the healthy plants and discard the small and weak. The following distances between plants are recommended: Leaf lettuce, chard and spinach, solid row; radishes, one inch; carrots, early onions, peas, early beets and turnips, two inches; bush beans, late beets, late turnips, late onions, late carrots and parsnips, four inches; lima beans, kohlrabi and celery, six inches; head lettuce, sweet corn, potatoes and asparagus, twelve inches; early cabbage, brussels sprouts, broccoli, eggplant, pepper, cauliflower, 16 to 18 inches; cucumbers and sweet corn in hills, four every three feet; muskmelon and summer squash, four every four feet; watermelon, pumpkins and winter squash, four every six feet; tomatoes staked two feet, not staked three to four feet. Beets, turnips, and head lettuce can be thinned lightly at first and then again a few weeks later when the beets and turnips make greens which are tasty and high in vitamin content; the thinned lettuce may be used in salads. Do not expect vegetables crowded in the row to be of high quality.

The main object in cultivation is to destroy weed growth. The best cultivation is a shallow cultivation and one which results in a shallow, level layer of loose soil on the surface. This dry mulch will keep down moisture losses. The garden should be cultivated after each rain or irrigation and just as soon as the ground can be worked without stickiness. Cultivate regularly, at least once a week during the early part of the season. An hour's cultivating at the right time will often save hours of work later. If cultivation and weeding are done in the early morning the hot mid-day sun will kill the uprooted weeds. Perennial weed roots such as wild morning glory or bindweed and

poverty weed should be removed and burned.

For the small garden the hoe and rake are satisfactory cultivating implements. As the garden increases in size, wheel hoes and hand cultivators will lighten the work. Farm gardens should always be planned for the use of horse or tractor-drawn implements. About this time of year it may become apparent that your crops are not growing as they should. If the soil has warmed up and growth is slow, you may decide to use a commercial fertilizer. A low analysis fertilizer such as a 4-12-4 can be used by sprinkling around the plants or down the side of each row then cultivating or raking it into the soil; a light irrigation may follow. Use the fertilizer at the rate of 2 lbs. per hundred foot of row. An additional application can be made about the middle of the season, using the same amount.

JUNE

1. Check suggestions for May. Were they all accomplished?

2. Make second planting of bush beans and sweet corn. Plant late potatoes, beets, carrots and celery for fall storage and winter use, in late June or early July.

3. Be prepared to protect vegetable crops from insect damage. Be selfish. Do not let insects destroy the products of your well-laid plans and hard work. Watch for bean beetles; they are the most serious pest of beans in Colorado. Squash bugs, corn earworms and Colorado potato beetles may appear this month. Continue spraying potatoes and tomatoes for psyllids. Don't let plant lice or grasshoppers get ahead of you.

Insect and Disease Control—

The crucial test for your garden comes next month. Give your garden a fair chance. Prevent insect damage. Regardless of how well the garden is cared for, insects and

disease are bound to appear.

A small hand duster or spray gun and the right kind of dust or spray is effective, inexpensive, and a very good investment. If you hit the bugs early and hit them hard, there is no secret to insect control. Learn to identify the common garden insects and discover the type of injury they do. Some insects, such as aphids and squash bugs, suck plant juices. Some insects, such as fleabeetles, grasshoppers and cabbage worms, chew holes in the stem or leaves.

Poisons applied to the leaf will not kill sucking insects. They must be hit with the poison and this means a special kind, a contact poison such as nicotine sulfate, rotenone, pyrethrum or sulfur. For chewing insects, a stomach poison, sprayed or dusted on the surface of the plant, will kill the pest when it takes a bite. Some of the new insecticides such as pyrethrum and rotenone are effective against many sucking and chewing insects. Frequently a combination dust or spray can be mixed at home or purchased which will give very effective insect control. This type can be especially recommended for the small garden. Mixtures containing sulfur also have certain disease-controlling values.

Hand picking is a very successful method of insect control for bean beetles, potato beetles, squash bugs and tomato worms. Mash the eggs found upon the plant at the same time you pick the insects off.

In the control of diseases, seed treatment, sanitation and good growing conditions are the important factors. Plants from good seed grown on clean ground and given good care may not be troubled with disease. Good garden sanitation is a continuous clean-up process of removing all weeds, sick plants, stems and other plant refuse found in and around the garden.

JULY

1. July is the critical month in the garden. Water thoroughly and stir the soil often enough so that it does not have a chance to crust over.

2. Never let any portion of your garden go to waste. Refer often to your garden plans. Just as soon as one vegetable is taken out sow some other vegetable in its place. Clean off and burn or compost early pea vines after harvest. Clean up all rows which are past their period of usefulness. Make your last plantings this month. Early varieties of dwarf beans, table beets, carrots, and turnips may be planted for storage.

3. Keep up insect control; how is the battle going? Watch for blister beetles, tomato hornworms and red spiders.

4. This is a good month to start the compost pile.

5. Go on a garden tour.

Irrigation—

Vegetables are composed largely of water. Water is necessary to carry plant food into the roots of the plant. Water is necessary to keep the plant from wilting. An even supply of water in the soil is necessary for normal, profitable growth. The soil is the pantry for the growing plant; the plant's source of food and drink. Over-watering carries away plant food. In saturated soil, plants will starve and suffocate for the lack of food and air.

Vegetable thirsts vary. All crops do not require the same amount of water. Quick growing and leafy vegetables, and shallow rooted vegetables require water more often than other vegetables. Vegetables with light green leaves will normally turn dark green when they need water and they may turn light green and even yellow when they are receiving too much water. When you can mold a compact ball

of soil which retains its shape in your hand when you let go, the soil contains sufficient moisture. You are the only one who can tell when to irrigate. Watch your plants carefully and do not let them suffer from thirst. If you have a dryland garden try to develop some supplemental water. How about a sub-irrigated garden?

Except for sub-irrigation, the most economical use of water can be secured by running the water along the rows in shallow furrows. Don't use the hose and nozzle if you can avoid it. The only exception is when the germinating seeds need a light sprinkling to get them through the surface of the soil.

When watering, a thorough irrigation every week or two is better than several light irrigations at shorter intervals.

Cultivate just as soon as the soil can be worked after irrigating. Fill the furrows. Do not cultivate too deeply as you may cut off roots close to the surface of the ground.

The Compost Pile—

Early pea vines, lawn clippings, radishes past their usable stage, tops from root crops, weeds and garden refuse of all kinds can be easily made into valuable plant food for use on your garden next spring. Make a compost pile; they are easy to build.

Select a space of the size desired, perhaps four by six feet for the small garden. Set firmly 4 posts about four feet high at the corners and if you have some unused poultry netting or other wire put it around on the inside of the posts. Throw in the refuse as it accumulates and when you have a layer eight inches deep then add two inches of soil. Repeat this layering process as refuse becomes available. Do not use diseased refuse.

Keep the pile moist through the summer and winter for the best

results. Wet it with the hose or throw a couple of buckets of water on it if it appears to be dry. Make it decay.

Decay can be speeded up and the compost made more valuable by mixing a bushel or two of poultry or rabbit manure through the pile. If manure is not available then 7 or 8 pounds of a balanced commercial fertilizer can be used for each 100 pounds of plant refuse. If manure or mixed commercial fertilizer are not available then 4 or 5 pounds of ammonium nitrate to each 100 pounds of plant refuse will give excellent results.

AUGUST

1. Watch the growing plants. Do not let them suffer from lack of water. They have just gone through the hottest month and, in many sections of the state, the driest month of the year.

2. Continue treatments to control insects where necessary; particularly continue psyllid control on potatoes and tomatoes.

3. Dispose of the early varieties of cabbage as they mature. Do not let cucumbers ripen if you expect them to bear late in the season. Harvest the onions which have ripened.

4. Study the selection and preparation of vegetables for showing. Exhibit at your local show, and try to be present when your vegetable exhibits are judged.

Selecting Vegetables for Exhibit—

Every gardener should exhibit, if possible. You will have several opportunities at local, town, or county fairs. You will be surprised and proud to see your vegetables win ribbons. The following hints should help you make a good exhibit.

The first thing to do is to read the premium list and rules carefully. Check those crops which you will have to exhibit. Never say "Mine are not good enough," or "I

have better vegetables at home.."

Vegetables are judged on quality and type. Quality for table use means fresh, clean, and of marketable size, with good color and proper maturity. Crispness and tenderness are essential with most crops. Too large specimens may lack quality, and may not be typical of the variety. Average sized vegetables are best for exhibition. Blemishes of any kind are objectionable, so make sure there is no bruise or injury caused by handling, insects or disease.

Exhibit what the premium list calls for. If it calls for "a plate of five tomatoes" then don't have six and don't have four, or your exhibit may not be judged. If collections are called for use plenty of space. Show the same number of each variety as you would show as an individual entry. Arrange your collection of vegetables to obtain balance, order, and neatness. Each kind of vegetable should be neatly labeled with the name of the variety.

In selecting the sample every vegetable in the sample should be uniform in size, shape, color and quality.

"If you should dig some spuds with care

And take them to the County

Fair,

Be sure they are like Mike and Ike
In color, size, and shape alike."

Root crops, if topped, should have about 1 inch of leaf stalks left on. Crowns should be small. Root crops should be washed only if necessary; a soft brush will do wonders in cleaning root crops. Potatoes should be brushed clean after the surface is dry; never wash a potato for exhibit. Stems must be left on squash, pumpkins and melons. Tomatoes must be solid, of good color for the variety and well ripened, at the time of the exhibit. Tomatoes are usually

shown with the stems on. Corn is shown with the husks on. The rows must be straight and the ear must be well filled from tip to butt with juicy, tender kernels of uniform size, shape and color. Be sure the ears are free of worm injury. Loose wrapper skins should not be removed from onions. Cabbage heads must be solid with the stem cut off. Just enough leaves are taken off to make the heads look good; leave the wrapper leaves on if possible. String beans should be straight, smooth, brittle and free of rust spots. Do not break off the stems of the bean when picking it. In all exhibits the variety shown should be true to type. Study pictures in the seed catalogs and when you make out your entry blank give the variety name.

Late the evening before or early the morning of the fair is a good time to select vegetables for showing. If gathered the night before place them in a protected cool place and cover with wet sacks or blankets to make them crisp. Leafy vegetables such as spinach and lettuce can be plunged in cold water to keep them fresh and crisp.

Handle your exhibits carefully and do not injure them when moving them to the show. Many exhibitors wrap each vegetable separately in wrapping paper and a basket is preferable to a bag or flimsy box in transporting them. Be an early bird and have your exhibit in on time. Preserve your ribbons for they will become more valuable to you each year.

SEPTEMBER

1. Thresh and store beans (dry).
2. Harvest and store onions.
3. Fight weeds; don't let any go to seed this month.
4. Continue the compost pile. Be sure it is kept damp.

Harvesting—

There is a proper time to harvest all vegetables. At this stage they

will be the most palatable, usually the most nutritious, and will possess the most quality. Lessons learned in selecting for exhibition will help you judge when to harvest. For the table, for canning, for freezing and drying the vegetables should be consumed or processed just as soon after harvest as possible. Knowing exactly when to harvest will come with experience and testing. If your garden has been carefully planned you will not have more than you can handle at one time. Most vegetables are at their best for only a short time. Home produced vegetables, just a short time from the garden to the table or can, are a treat no restaurant or store can supply.

Vegetables such as peas, corn, beans and cucumbers are at their best for only a short time. Harvest peas when the pods are about full; string beans when the pods are tender and before the bean seeds become too large. Corn which squirts with enthusiasm is ready for corn on the cob. For canning, the corn can be a little older but should still be in the milk stage. Cucumbers are prime when they are small and, if you want them to keep bearing, don't let any get over ripe.

Root crops such as radishes, carrots, beets and turnips should be harvested when small for best quality. Parsnips may be left in the ground all winter and harvested in the spring as needed. Head lettuce becomes worthless in a short time. It should be used as soon as the heads are firm and compact. Tender crisp leaf lettuce, spinach and chard may be harvested repeatedly if clipped so as to leave about one inch of the crown above the ground. Cauliflower should be bleached. As soon as the head has started to firm, the leaves should be tied over the top. Broccoli should be harvested when the

head is compact. This is before bloom. Light frosts improve the quality of broccoli. Harvest and utilize cabbage when the heads are firm and compact and before they burst.

Summer squash are used when they are small and tender. The zucchini squash is used when it is six to eight inches long. Winter squash and pumpkins are ready when the shell is hard enough to resist the thumb nail.

Tender young beets from thinning, beet tops and turnip tops make excellent greens.

Always handle vegetables carefully. Cutting and bruising will cause them to decay more rapidly. Radishes, tender carrots, lettuce and greens can be crisped by plunging in a pan of cold water immediately after harvesting. Keep them wrapped in a damp towel or cloth and they will remain crisp for several hours.

OCTOBER

1. Harvest and store root crops, cabbage and celery for winter use. Dig and store potatoes.

2. Remove all refuse and clean up the garden to destroy insects and diseases.

3. Harvest and store pumpkins after frost nips vine but before they are frosted.

4. Dig and store a few parsnips. Put a few inches of leaves and a little dirt over the rest of row.

Storage—

Live storage is the most economical method of food preservation. Vegetables most adapted to storing, such as root crops, potatoes, cabbage, onions, pumpkins, and winter squash should be stored, so that jars are available for canning greens, peas, beans and corn.

Good storage facilities can be provided for at least a limited amount of vegetables at little or no cost. Know the conditions the vegetables prefer for storage and treat

them kindly. Follow a storage chart. Vegetables for storage should be harvested as soon as they are mature. Root crops and potatoes are better off in the ground than in a pit or trench if they are ready for storage before the cool season approaches. Store in late fall.

Root crops and potatoes require lots of moisture in the air and keep best when stored just about freezing temperatures. Pits or mounds are desirable. Sand boxes when the air in the storage room is dry are better than bins. When using mounds or pits put about two bushels of mixed root crops in each mound. When using sand boxes put several kinds in each box. Discard all immature, all large and over-grown, all cut or bruised and all irregular shaped vegetables. Leave about one inch of stem on all root crops that are to be stored. The soil should not be wet when root crops are dug for storage, and storage crops should never be handled when wet.

Cabbage requires the same conditions as do root crops, moisture and cool temperatures. It will stand light frosts. Trenches are satisfactory for storing cabbage. They should be wide enough so that the two heads can be placed side by side with all outer leaves on, roots up, and placed on two or three inches of straw or dry leaves. The trench should be deep enough so that the roots extend above the surface of the ground five or six inches. Cover and mound over the heads with straw and then dirt; add more dirt as extreme cold weather approaches.

Squash and pumpkins are harvested with the stems on before frost. For storage they require a dry warm place. The straw pile or a warm attic room are suitable storage places. They prefer a temperature of 50 to 65 degrees. Shelves in the basement are a pop-

ular place. Do not allow them to touch one another in storage.

Onions like it cool and dry. They are harvested when the tops are yellow and have fallen over. Leave them spread out in an airy shed for several days before topping. Large, thick-necked onions will not keep well and should be utilized first. Onions may be stored in trays or net bags, in cool attics or outbuildings where there is no danger of freezing.

Celery may be stored in trenches in the garden similar to those used for cabbage. However, the roots of the celery are left on when transplanted in wet soil in the bottom of the trench. The celery may be allowed to touch and should be firmly packed in the trench in an upright position.

Transplant boxes placed in the storage room may be used to store small amounts of celery, head lettuce, chinese cabbage and immature cabbage. Keep the soil in the box moist but do not get water on the green portions of the plants.

Green tomatoes may be harvested before frost. When wrapped in paper and stored in a dark place at about 65 degrees they will gradually ripen, retaining most of their flavor.

A few special hints on storage. Do not store turnips and cabbage in the house basement, as their odor may go through the entire house. Apples and celery will absorb odors and so acquire unpleasant flavors; do not store them with cabbage, potatoes or turnips. Always store vegetables in a dark place. Examine stored products frequently to prevent spoilage spreading. Keep the storage place clean. A layer of sand an inch or two deep on the basement floor frequently moistened will assist in keeping up the humidity. Boxes and baskets are preferable to built-in bins. By their use less handling

of the vegetables is necessary and they are easier to keep clean. A basement storage room or an outdoor storage cellar requires little investment and will pay dividends for many years.

NOVEMBER

1. Manure and plow garden if it was not done last month.

2. Clean out hotbeds, cold-frames, and flats.

Preparing the Garden for Winter—

As soon as frost kills a garden all dead plants and refuse should be cleaned off and placed in the compost heap. Extremely woody material or plants badly diseased and harboring insects may be piled and burned. Remove all stakes and poles and store them away for next year.

Soil is the basis of good gardening and fertility must be retained. If well-rotted barnyard manure can be secured a liberal application, 20 tons per acre (1 pound per square foot) should be made. Do not apply poultry manure in excess of one pound per 10 square feet. Fall plowing will assist in decomposing the organic matter applied and freezing and thawing during the winter will help make a deep, mellow seedbed for spring planting. In the spring before planting, the compost you have made may be worked into the soil as the seedbed is prepared, as a top dressing. Do not apply commercial inorganic fertilizers in the fall but save them for use during the growing season.

DECEMBER

1. Start next year's garden plan on paper while this year's experience is fresh in mind.

2. Get all tools ready for next year's use.

Care and Repair of Tools—

Good tools well cared for will give you lots of pride and satisfaction. They will also lessen labor. We hope that you have kept them shiny and sharp during the sea-

son. Remember, the place to use a tool is in the garden but when not in use, each tool should have a place of its own, to make it easy to find. Some tools such as rakes, hoes, and shovels can be hung on the wall on nails. Outline the place for the tool and perhaps paint the space they occupy.

After the tools have been thoroughly cleaned the wooden parts should be painted; bright colors such as orange or yellow may save you time next year by making them easier found if you happen to leave them lying in the garden. All metal parts, especially the shiny parts, should be cleaned with kerosene and then coated with oil to

prevent rust. Moving parts such as the wheels and bearings on the hand cultivator or lawn mower should be packed with a good grade of cup grease. Spray equipment should be thoroughly cleaned and parts which might rust should be well oiled. If you find on inspection that there are worn-out or broken parts, now is the time to replace them.

Never leave tools lying around. If not in immediate use tools such as spades and forks should be stuck upright into the ground. Rakes and hoes should be propped against a tree or fence if possible; never leave them lying flat with their tines or blades upright.

GARDEN NOTES:

Plans and Products of My Victory Garden

The Green Thumb

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Mature Bristlecone Pine on Hoosier Pass

Photo by H. L. Standley, from "Colorado Evergreens"

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THE GREEN THUMB

A BULLETIN OF

COLORADO FORESTRY AND HORTICULTURE



George W. Kelly, Editor

4849 SOUTH SANTA FE DRIVE - LITTLETON, COLO.



The first issue of our bulletin was called simply "The Green Thumb." This seemed to be the most appropriate name thought of at that time. It has since been suggested that we add the descriptive phrase, "A Bulletin of Colorado Forestry and Horticulture." How do you like this combination?

The last issue of our little paper was given over entirely to information helpful for Victory Gardeners, and this issue also contains some additional articles related to vegetables. It was not the original intention of the organization to cover more than ornamental horti-

culture, but we believe that helping along the Victory Gardens is very timely, and we are glad to be able to do so. In publishing information relative to Victory Gardens, our object will be, as in regards to general horticulture, to supply information particularly applicable to our peculiar Colorado climate. General vegetable gardening information we have in plenty, but as usual much of it does not take into consideration Colorado conditions. Some articles of general interest originally planned for this issue will follow in an early number.

OBJECTIVES OF THE GREEN THUMB

The first and foremost object of "The Green Thumb" is to supply horticultural information applica-

ble to the Rocky Mountain region. Horticultural literature we have in plenty in these United States, but

if any eastern writer gets as far west as the Mississippi River, he makes a flying leap to the Pacific Coast, and leaves the Rocky Mountain area truly the forgotten country horticulturally.

Let us see then why there is such a need for horticultural information written for Rocky Mountain conditions. Just what are the peculiar climatic conditions which make this a very different country horticulturally? Perhaps 50 per cent of the plants and practices advocated in the average horticultural book or magazine are not suitable here.

Let us get clearly in mind what these peculiar climatic differences are so that we shall know why we must revise most horticultural writings to fit our Rocky Mountain conditions. Most of the Rocky Mountain area where people live and practice horticulture is near the foot of the mountains where the climate is in many ways almost that of a desert. The rainfall is light, and cloudy moist days are rare. In any region of light rainfall the soil is inclined to be alkaline. Our altitude gives us a short growing season. Our nearness to the mountains probably in-

fluences the weather so that we have very irregular Springs and Falls. In Canada, where the weather is either winter or summer, they can raise plants that are impossible here, because of the frequent and unpredictable spells of cold or warm weather through many months of the year. Our air here is dry most of the year, and we have many weeks of bright sun in the winter time when plants are dormant and unable to combat this drying out. Denver is in temperate zone III, which means that there is only one zone in the whole United States where the average minimum temperature is lower than it is here. This combination of little rain, alkaline soil, high altitude, irregular weather, cold spells, dry air and hot sun in winter are our particular combination of horticultural peculiarities and problems, and are the things which will be discussed and explained in this magazine.

We plan a series of editorials to further explain these differences and problems of our region, probably entitled: "Why Rake?" "Why Trim?" "Why Cultivate?" "Why Fertilize?" "Why Water?" "What Do We Mean By Hardy?"

JOIN THE COLORADO FORESTRY AND HORTICULTURE ASSOCIATION NOW

The first two issues of our bulletin were sent to a large list of names of those who might be interested in the objects of our organization. It must be plain to all that we cannot continue to send out large numbers of these valuable bulletins with the income from a few members at \$1.00. The best way to make this self-supporting is to enlist a large number of members at the \$1.00 rate and more sustaining members at \$5.00. We hope to make the information in these bulletins worth much more than the small membership fee. If

you think that the objects of this organization and bulletin are worth while send in your membership and tell your friends about it.

It should be understood that this new organization is not intended to take the place of any existing organization. It is not intended that it will concern itself with business or other problems peculiar to various existing groups. It is not intended that all articles in the bulletin will be of interest to all members. The one thing that brings us together in this organization, from many groups of varied interests, is

our common love for growing plants. This is well expressed in the name of the bulletin, "The Green Thumb."

But further than our general interest in growing things, is our interest in the horticultural peculiarities of our own Rocky Mountain country. To collect and disseminate horticultural information correct for this area is our common purpose. We must keep this purpose always in mind so that we can hold together all the members of varied angles of interest.

Let us not expect that everyone will be interested in our purposes,

but let us try to find all those who love plants for any reason and invite them to join us. And, for the sake of the good that we can do by being united, let us be prepared to be tolerant of others who do not see things quite as we do. If we all have "A Green Thumb" we will work together and make of this an organization to be proud of.

Let our aim be to keep all information put out by the organization just as nearly correct as possible and we will be able to fill a long-felt need, do much good and gain a worthy reputation.

WHY RAKE?

As I was driving by a big institution a few days ago I noticed several old men out raking the lawn and under the trees and shrubs. They were piling up and hauling off truck loads of dead leaves and grass. Spring was in the air, so of course one must rake.

With the shortage of labor and so many other important gardening operations needing to be done it seemed a shame to have these men doing this raking which was not only unnecessary but was actually a detriment to the grounds. Of course raking makes a place look neat, but if in raking most of the humus so badly needed in this country is removed, it is not always a good practice.

We should know what we are doing when we rake, and consider whether the neatness acquired is worth the removal of valuable mulch and humus. To rake off all the dead leaves and litter from beneath trees and shrubs is doing them no good. Dead leaves on the ground are a natural thing and really do not look badly. They act as a mulch to retain moisture in the soil, help keep a good soil temperature and eventually produce valuable humus.

I have watched gardeners rake and then wash with the hose all the loose humus from the surface of their lawns, and then at once spread fertilizer back on. Sometimes the manure itself is raked off a short time after it is put on! This seems very foolish when we stop to reason it out. Most lawns are benefited by leaving on most of the grass clippings. It makes a covering which catches rain, reduces evaporation, covers the soil to prevent weed seeds getting started and gradually decomposes to produce valuable fertilizer.

This passion for neatness also induces people to rake off much good material from their gardens which should be worked into the soil during cultivation. Of course leaves and litter from diseased plants should be burned, but otherwise any excess plant tops should be piled on a compost pile to decay.

Humus is the material that most of our Rocky Mountain soils need most badly. It will loosen a heavy soil, and enable a sandy soil to hold more moisture. In decaying, it also releases valuable chemicals for the use of plant growth.

When you get the urge to rake, stop and think, "Am I doing real good or harm?"—George W. Kelly.

Watering Your Victory Garden

By WM. H. LUCKING, JR.

Practical Advice By a Man Who Knows

There are two fundamental ways of watering a vegetable garden; one is by taking a hose and sprinkling, the other by making a furrow and irrigating. Either method has its advantages.

Most of us know how to sprinkle a lawn, but watering a vegetable garden with a hose is somewhat different. When watering a vegetable garden you will have to know when and how to do it. One of the first things is the watering at the time of planting. After planting your seed you will have to give the ground a watering by taking the hose and using a fine spray, wetting the soil down well. Then watch your soil so that it does not form a crust on top. If a crust does form, give it a light sprinkling each day until your plants come up. Do not sprinkle your garden too much when the weather is cool. Vegetables take a great deal of water when the weather gets warm. It is best to do the sprinkling of your garden in the early morning or late evening. Be sure to give it a good soaking, then do not water again until the soil has dried out. It is a good plan to cultivate, when the soil is dry enough, after each sprinkling, loosening the soil so as to form a mulch. By cultivating often you conserve the moisture and make a better growing condition.

When watering by furrow irrigation the one important thing is to have your garden plot smooth with just enough slope for the water to run slowly. By furrow irrigation we mean making a small ditch or furrow along the side of

the vegetable row, and letting the water soak in as it runs along; using the same method as in sprinkling, of soaking the soil well, and then cultivating after each irrigation.

It is a good plan to divide your garden in two parts, one for sprinkling and the other for furrow irrigation. Vegetables such as corn, tomatoes, cucumbers, squash, carrots, head lettuce, parsnips, peas, and beans all do much better with furrow irrigation. Vegetables like spinach, leaf lettuce, radishes, swiss chard, turnips, beets, cabbage and cauliflower all do well with sprinkling.

If the season is very hot and dry it will do no harm to sprinkle or wash off the whole garden occasionally. We might add that there is one more way to water a garden, and that is by flooding it. Flooding does not mean to cover the whole garden with a foot or so of water, but by this we mean the method of letting the water from a hose spread over the ground and soak in slowly. By moving the hose around quite often, ground that is not level can be irrigated this way.

In sprinkling or irrigating, do a thorough job. Water your garden well, then, when it is dry enough, cultivate. Do not water too often. Do not sprinkle vine crops; it will cause rust or mildew. Such vegetables as lettuce, spinach, turnips, beets, radishes and Swiss chard will take more water than some others.

Last year there was a grand showing of Victory Gardening. Let us all try to do as good, or better, this year.

Victory Gardening In Colorado Is Different

By M. WALTER PESMAN

"You should lime your garden every third year." "The making of an asparagus bed is a difficult and complicated job." "Anthracnose is one of the most serious diseases of beans." "Ponderosa and Oxheart are among the best varieties of tomatoes."

Don't believe these statements even if you do find them in reputable (Eastern) textbooks. They are illustrations of the need of Colorado information for the growing of Colorado plants. The fact is: that asparagus is so easily grown here it is becoming a roadside weed around Grand Junction, — that most of our soils have no need of added lime at any time, — and that Marglobe and Stokesdale are a lot better adapted to Colorado than most other tomatoes.

Specific facts for Colorado Victory Gardens are highly essential and not easily obtained. Again and again we get information from the East, or even from England; some of it is absolutely misleading and wrong.

Misinformation from these sources is especially common in these four fields: 1. Planting dates. 2. Soil requirements. 3. Varieties of vegetables. 4. Plant pests.

1. **When to plant** is often determined by Zone maps, showing latest killing frost in spring and earliest killing frost in fall. Interestingly enough these zone maps often stop at the eastern boundary line of Colorado, New Mexico and Wyoming. No information is available for the Rocky Mountain region, and not until we come to California do we again find dependable data. The only way out is to get a local list of seasonal data from the Colorado yearbook. For instance, the latest killing

frost ever recorded for Denver was June 6 and the earliest fall frost September 12. That leaves only 98 growing days for tender plants. This of course does not hold for such hardy plants as spinach, peas, turnips, cabbage and many others. Normally the length of growing season is shown to be 160 days for Denver, from May 3 to October 10. It all goes to show that we cannot afford to take generalities for planting dates, as given in some Eastern catalogs and gardening books or magazines.

2. **Soils information** about Colorado is often missing. Just because "sour soils" are not uncommon in New England, well-meaning people are apt to ascribe all soil troubles to "acidity" and then follow up the wrong diagnosis by the wrong prescription, namely lime. The fact is that sour soils are very, very rare in our gardens; on the other hand, too much alkalinity is not at all uncommon. The remedy? Grow plants that can stand alkaline soils and provide proper drainage with proper irrigation. As luck will have it, a great many vegetables can stand quite a bit of alkalinity. In general, our soils have enough of all chemicals; the only elements that may need to be added are phosphorus and, rarely, potash. Nitrogen is plentiful in all fertilizers and manures. Adding Vitamin B¹ has not shown spectacular effects here as it has in California.

3. For the best **varieties of vegetables** consult, not Eastern, but local catalogs and the list of Colorado varieties issued by the Colorado State College. These lists have been carefully tested. Naturally there is some difference between different regions, such as the San Luis Valley, the Arkansas Valley, the Greeley region and the low,

mild-weather region around Grand Junction. But all in all, you can't go very far wrong by following local catalogs. One thing should be mentioned: often home varieties are different from commercial varieties, and dry-land from irrigated culture. (See bulletin: "Adapted Vegetable Varieties for Colorado," A. M. Binkley.)

4. **Plant Pests**, both insects and plant diseases, are not at all the same here as they are in Massachusetts, Virginia, or California. This stands to reason since our dry climate discourages certain insects (and especially a number of fungous diseases), but also attracts others. Nematodes or eelworms, for instance, are quite serious in the South, but are hardly known here. Potato psyllids, on the other hand, the common cause of potato failure in Denver, are not even

mentioned in many books on harmful insects. Potato beetles are less choosy; they are all over the U.S.A.

To guard against misinformation, state bulletins should be consulted. The Colorado State College issues special lists of diseases and insects (see for instance "Save Your Garden," by Sam C. McCampbell, and "Diseases of Victory Gardens," by W. J. Henderson).

Luckily the general run of remedies holds for both native and introduced troubles; little difference of application is found between the East and the West and the Rocky Mountain region.

The Colorado Forestry and Horticulture Association intends to point out specific information for this region in its publications to come. That will make it possible to combat Colorado insects and diseases with Colorado methods.

WHY VICTORY GARDENS?

We Need 30 Per Cent More This Year

Food has always played a very important part in any war, and it is especially important now.

Last year 40 per cent of the vegetables raised in this country were from Victory Gardens. This wholehearted response to the appeal for Victory Gardens helped to keep down the price of vegetables; relieved transportation that would have had to handle the same quantity produced commercially; made it possible for many to have vegetables that would not have had them otherwise; gave many their first enjoyment of really fresh vegetables; and did much to improve the health of the garden workers both physically and mentally.

This extra 40 per cent of vegetables raised in Victory Gardens just about balanced the increased demand from our own war workers, soldiers and lend-lease; and

they were produced largely by extra labor; labor that might not have been put to any other profitable use. Children and adults learned many valuable lessons by participating in this very fundamental work.

About 15 per cent of those who put in Victory Gardens last year will not do so this year. Part of the reason may be laziness and a slackening of the first enthusiasm; but many found that they did not have the proper equipment to successfully raise a garden. Their soil was not good, or there was too much shade, or not enough available water, or business did not leave sufficient time, or other reasons. Of course where conditions are not suitable it is really a waste of seed, fertilizer, water, and time to attempt to raise vegetables.

Last year the weather was favorable for a bumper crop. This year may not have as favor-

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Flowering Crabs For Colorado

Many of the spectacular flowering trees of the East and South are not hardy in Colorado. This makes it desirable that we search for more good varieties and species of those genera known to have kinds suitable for this climate. The flowering crab apples seem to offer one of the best fields for experimentation. So far no other flowering trees have been tried here which have given such general satisfaction. As is true so often, many of the crabs of the east are not satisfactory here, and some considered of mediocre value in the east prove to be our best kinds.

To put into effect the policies of the Colorado Forestry and Horticulture Association we will attempt to collect the experience of Colorado horticulturists and make it available to the membership through our bulletin. We thought it appropriate to start with a survey of experiences with flowering crabs.

Of 75 horticulturists over the state questioned, about half have replied. These total almost 500 years' experience, or an average of about 15 years each. Where a majority have found certain kinds good, or where others have been generally discarded, this is rather safe information to be governed by. Some kinds have been tried by only a few or for only a few years. Regarding these, we can only say that they are worth further trial. We shall not attempt here to repeat details about crab apples in general which may be obtained from such publications as "Crab Apples for America," by Donald Wyman, and Bailey's *Cyclopedia of Horticulture*. We will only call attention to those characteristics which make them suitable or unsuitable for growing in Colorado.

Three kinds stand out above all others in their popularity in Colorado, viz: The Bechtel, Hopa and Dolga. Twenty-three voted for the Bechtel, with only one against. It is an outstanding tree when in full bloom, with its masses of double pink flowers. The shape of the tree is naturally rather symmetrical, in contrast to its parent, the Prairie Crab. It is of rather slow growth, which is another good point. There are two chief objections to the tree. First, that it does not drop its petals when they fade, making the tree unsightly for weeks after it has passed its prime of bloom. Second, it is sometimes disfigured by fire blight. But for all its faults, there is no flowering crab apple which is quite so well loved.

The Hopa is next in favor, and rightly so. Twenty-two voted for it, with no objectors. It is of neat upright habit of growth, practically immune to blight, and the beautiful rose-red blooms are very attractive. The Hopa is a result of a cross between the Redvein and the Siberian Crabs. Most of the hybrid crabs having the Redvein as one parent seem to be very happy in this climate. Rose-red bloom, red flesh of the fruit and red coloring in the stems usually indicate some relation to the Redvein Crab. About the only objection that could be found to the Hopa is that there is not much contrast between the dark pink flowers and the dark green leaves, but much of the time the tree comes into full bloom before the leaves unfold, so this is not always a fault. The tree grows rather rapidly which might be an advantage or disadvantage, depending on its use. The fruit is small, dark red, rather ornamental, but of little use as food.

The Dolga rated very close to

the Hopa, with 16 voting for and none against. The Dolga's popularity is the result of several good qualities rather than only one spectacular showing as with the first two kinds. This tree as the Hopa is the result of some of Prof. Hansen's experiments. The flowers, being white when open with only a little showing of pink in bud, are not as striking as those of darker coloring. The fruit is very desirable, both from a beauty and utility standpoint. The apples are almost the size of golf balls, and when ripe are a brilliant red, giving the effect of a Christmas tree loaded with bright ornaments. The fruit will remain in good condition for a long time, but when its value for jelly and jam is appreciated it is usually picked and used. The red coloring to the skin and flesh makes fine colored jelly, and the flavor is equal to any. The Dolga is a little less symmetrical in growth than the two preceding kinds, but has a branching habit which makes it one of our best trees for espalier use. It is a sturdy grower and very resistant to blight.

Next in favor comes the Eley Crab, with 5 votes for and none against. It is another of the Redvein hybrids, and has many good qualities. It seems to be as hardy, fast growing and immune to blight as the Hopa. The habit of growth is much more spreading and loose. The flowers are a darker rose-red than the Hopa and more showy. It deserves to be used more.

Red Silver is still another of the Redvein hybrids and is due for much wider use when it is better known. It received 3 votes. The habit of growth is medium spreading and rather dense. The flowers are similar to Hopa or Eley, but a little different shade. The outstanding attraction of this tree is its leaves. As the name indicates,

they have a reddish green appearance with silvery white hairs on the under side.

The Redvein Crab (*Malus pumila niedzwetzkiiana*) is still grown by some, tho almost an equal number find its faults objectionable. It bears the typical rose-red flowers and the fruit is large and good to cook. The growth habit is rather spreading. The general opinion of those who have grown it and some of its hybrids is that the children are an improvement over the parent. It seems to be of irregular growth and more subject to blight and sunburn.

The Prairie Crab (*Malus ioensis*) certainly has a place and might well be more generally used. The fact that it is of more informal habit of growth and that the flowers drop their petals when faded make it very useful in many situations. The color of the bloom is the same as its popular sport, the Bechtels, and the fragrance is something to remember. It is somewhat subject to blight.

A number of little known crabs are being tried out by a few people. Some of them will very likely prove of merit when enough years have gone by and enough have been tried in varied situations. Some of these are *Malus arnoldiana*, *M. purpurea alldhamensis*, *M. transitoria*, *M. Zumi calocarpa*, and *M. sargentii*.

Several kinds have been tried and found wanting. The Floribunda is generally unsatisfactory on account of susceptibility to blight and sunburn. The Siberian Crab (*M. baccata*) grows vigorously and has some value both for flower and fruit, but is subject to blight which in many cases ruins a good tree. The eastern wild crab (*M. coronaria*) is a charming tree in the Eastern Woods, but has not grown so well here. *M. Scheideckeri* and *M. Halliana Parkmanni* are report-

ed to be grand trees in the East, but have been generally a failure here.

Of the Crabs used sometimes for their landscape value, but chiefly for their fruit, the Florence seems to be the favorite. It is reported to be an early bearer of good quality fruit and practically immune to blight. Some definitely not recommended in this class are Whitney and Hyslop.

HELPS FOR VICTORY GARDENERS

"How to Make a Better Victory Garden," by the Master Gardener. 1944 edition. Put out by Swift & Co., makers of Vigoro. Free at your seed store.

"Grow What You Eat." Plans and suggestions for your Victory Garden, presented in a four-act playlet published by the makers of Planet, Jr., Garden Tools. Free at your dealers, or send a postcard to S. L. Allen & Co., Inc., 3414 North 5th St., Philadelphia 40, Pa.

Send to the Extension Service, Colorado State College, Fort Collins, for any of the following:

"Vegetable Varieties for Colorado."

"Vegetables for Victory" (planting dates, etc).

"Starting Vegetable Plants."

"Irrigating the Victory Garden."

"Pest Control on the Home Front."

"Diseases of Victory Gardens."

"Growing Tomatoes in Colorado."

"Strawberry Production in Colorado."

"Dwarf Fruits."

"Orchard Management in Colorado."

"Grape Growing."

Note: Colorado gardeners can depend upon the information from Fort Collins to fit their needs. Write for any help not listed here.

BRISTLECONE PINE

The Bristlecone Pine, or Foxtail Pine (*Pinus aristata*), is a native of Colorado, found at the higher altitudes. Its needles are usually dotted with globules of pitch. As no other native evergreen has this characteristic, the tree is very easy to recognize when such exudations are found on the needles. The needles occur in bundles of five, are very dark green, thick and short, and hug the branches, with the result that the ends of the branches resemble foxes' tails. The Bristlecone Pine becomes very picturesque at maturity, as is shown by the illustration.

Although this tree is available at local nurseries, it has been much neglected in Colorado landscaping use. It is naturally slow-growing, and if, in addition, the "candles" that are formed by the buds in the spring are cut in half just prior to the time that the new needles break forth, the tree can be kept "in scale" about the small house for many years. Often it has a number of stems and is bushlike in form, thus adapting itself to hedge use. Although it is sometimes somewhat difficult to transplant, once established it seems to have few enemies, and if given plenty of sun and a well-drained, open soil, will take care of itself under the most adverse climatic conditions.

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able weather, so it is necessary that we make allowances for some failures and plant a greater acreage in food crops.

Since the demand will be greater this year, and there will be some former gardens abandoned, and weather may not be so favorable it is very important that all who can do so put in new gardens and increase the size or efficiency of their former plots. This organization feels that it should do all in its power to encourage new Victory Gardens and help all gardeners to get more from their efforts.

D. M. ANDREWS

PIONEER ROCKY MOUNTAIN HORTICULTURIST

(Editor's Note: In these pages we should like occasionally to call your attention to some of the early pioneers in Rocky Mountain horticulture. It is very appropriate to start the series with Mr. Andrews, who was probably more active than anyone else in introducing plants of the Rocky Mountains to the world.)

Darwin M. Andrews was a good example of the old statement that "A prophet is not without honor save in his own country." He was known and appreciated by botanists all over the world, yet so quiet and unassuming was he that few who lived near him knew of his achievements in horticulture.

D. M. Andrews was born October 3, 1869, in Farina, Ill., and died in Boulder, Colo., August 14, 1938. These dates are unimportant, but the years in between were not. They were full of worth-while activity and noteworthy achievements.

The boy's first education came from his mother who was a college graduate. His interest in horticulture also came from his mother, who taught him about plants and Nature along with his school subjects. As a young man he attended Milton College in Milton, Wisconsin. He paid most of his way in college by collecting plants. In 1893 he came to Boulder, Colo., and that fall married Mary Wheeler, who continued the fine influence of his mother. Mrs. Andrews was his companion on many of his plant hunting expeditions and was always as much interested in the work as was Mr. Andrews himself.

The Andrews Nursery in Boulder



grew from a small plot with a few kinds of flowers for sale to the large Rockmont Nursery in its present location, which was known all over the world. He was never a nurseryman from the commercial angle, however. He was in the business because he loved the plants and wanted to make them available to others. He repeatedly turned down opportunities to expand his nursery and cash in on some of his discoveries, by saying, "The business is big enough now. The added responsibilities of a larger business would not leave me time to do the work with plants that I want to do."

The botanist, Herbert Durand, visited Mr. Andrews in 1929 and said of him, "Mr. Andrews has done more in his quiet way for horticulture than Luther Burbank

ever dreamed of doing. On a trip abroad last year everyone I met in horticultural circles asked me if I knew Darwin Andrews, and that was the first question I was asked when I went into the Royal Botanical Gardens of Edinburgh."

He introduced a number of peonies, lilacs, iris and phlox, but his chief interest was in domesticating native Colorado plants and shrubs for use in the home garden. He believed that the native plants were more beautiful than many imported from foreign countries, and he did some remarkable work in that line. At the time of his death he had retired from active work in the nursery and was devoting his whole time to the breeding of phlox.

He was considered an authority on rock garden plants. In the "Better Homes and Gardens" of March, 1935, it was said, "Years hence Darwin Andrews will be eulogized as one of America's greatest plant breeders."

He took many prizes for his plants, the outstanding one being the highest rating in the American Iris Society's Symposium, for his seedling iris, Candlelight. He was honored a few years before his death by the University of Colorado, which awarded him the honorary degree of Master of Science.

Shortly after his death a distinguished horticulturist wrote, "We who knew Mr. Andrews personally have lost more than the world in general; the man was as fine as the scientist. Why is greatness so often associated with humility,

with simplicity, and with friendliness? A visit with him was initiated by the feeling that he was truly glad to see you, interested in any phase of horticulture or botany, and ready for a straightforward discussion of almost any worthwhile subject. He must have known the word sham, and he may have encountered it, but it could not persist in his presence. Mr. Andrews will be remembered as a plant breeder of very high rank, all the more noteworthy because devoid of all grandstand play and press agent notoriety. Few people can have oaks, cottonwoods and other native plants named after them; Andrews' Poplar is finding an important place in the plantings of the Rocky Mountain region. Other natives have been introduced to the general public by Mr. Andrews. Whoever heard of *Forestiera* as a hedge plant, of the numerous types of native cacti and heuchera, pentstemons and yuccas until he made us see their outstanding merits? Scores of Rocky Mountain trees and shrubs, little known even ten years ago, are now beginning to be used in gardens. He used to travel thousands of miles in plant hunting."

The valuable notes so carefully collected and preserved by Mr. Andrews during his lifetime of horticultural work have been assembled by his family and friends, and we are still hopeful that it will be sometime possible to publish them, so that all may benefit by his long experience.

CRASSINA GRANDIFLORA

If you want a plant that will bloom literally all summer in a rock garden or in any hot, sunny, very-well-drained spot, the little *Crassina grandiflora* will do just that. Common name? Here's a job for the infant Horticultural Society. Christen it. "Pouring Gold" might fit.

A mature plant of this is from one to one and a half feet in diameter, spreads out happily with adequate foliage and no awkward bare knees.

From June till after frost if it is happy it bears quantities of golden yellow single daisy-like flowers consisting of broad bracts. This bract business being the secret of long season bloom, for each flower sits there looking perky for an incredibly long time, even in baking hot sunshine. Interesting how much more enduring are all bracts than petals.

Nelson's description is graphic: "Closely appressed — imbricated bracts, dry and firm, broad with rounded summit — the chaffy bracts conduplicate around the disc flowers."

These disc flowers which form the center are usually a deep burnt-orange color. The habit of this plant as it matures is to pour over the ground something like pancake batter on a griddle, not prostrate, nor creeping, nor dwarf, nor any of the other objectionable adjectives which have somehow attached themselves to innocent and beautiful plant victims.

How to grow it? This requires perseverance, for plants are not easy to establish. Their woody, stringy, long roots make transplanting uncertain; so they must be moved while very young. Seeds germinate slowly and uncertainly except in spots of their own choice in the wild where they come up in dozens. These youngsters collected early in May, planted with prayers,

and covered for a week soon feel at home and often bloom well in late summer.

It is found at home on stony hillsides north from Canon City and Pueblo and at intervals from Colorado to Arizona, usually at elevations of 3,000 to 5,000 feet.

Our latest find is that a half-inch layer of peatmoss spread on the ground around a mature plant, with one or two rocks dropped towards the outer edge of this peat "rug" results in a crop of voluntary seedlings. — Kathleen Marriage, Colorado Springs.

FOREST NOTES

A "Forest of Thankfulness" will be planted in England, near the Kent coast to commemorate the heroes of Dunkirk—every one of them. Hardwood trees, "the kinds used to build big and little ships," will be used. England is planning for this while the war is on.

Ten years ago the City of Springfield, Illinois, started its ambitious program of planting a million trees and shrubs around Lake Springfield and on 4,000 acres of marginal land. As many as a hundred men have been employed at one time. Reforestation is closely connected with recreation.

Before the war a city in Germany derived all its necessary income from a City Forest, conducted on proper forestry lines.

Can Colorado towns get an inspiration from these examples? In the post-war planning it might be well to give a thought to City or Regional tree planting. Done on the basis of a carefully studied survey—in places where trees can readily be grown—following a plan drawn up by people who really know—we may have an opportunity of providing work for returning soldiers, and of furnishing recreation for all the coming generations.—M. Walter Pesman.

MAY GARDEN CALENDAR

Check List of Seasonable Work

FIRST HALF—

Finish planting new trees and shrubs or transplanting old ones before they come far out in leaf. Perennials can be moved with a ball of soil almost all summer.

Set out early cabbage, cauliflower and celery plants.

New lawns can be planted all this month. It pays to prepare the soil well. Reseed bare spots in old lawns. Do not water lawns too much now or they will develop shallow roots and suffer during the hot weather next fall.

If you did not give your juniper, dogwood, snowball and euonymus a dormant spray look now for aphids. They do a great deal of damage very early on these plants.

Sow seeds outdoors of marigold, cosmos, bachelor buttons, larkspur and calendula.

Start cultivating and weeding as soon as the weeds show up. A little work now saves a lot of work later and prevents your valuable plants being crowded and damaged.

Thin the little seedlings before they crowd each other too much.

How about starting a small herb garden this year? It is fun and profitable.

SECOND HALF—

Plant beans, corn, melons and squash.

Set out plants of tomatoes, eggplant, peppers, and late cabbage.

Clean out the pool and plant the water lilies. They like a very rich mixture of soil and manure.

Set out plants of tender annual flowers such as zinnias, asters, petunias, snapdragon and stocks.

Finish cleaning up rose and perennial beds. There should not be any more snow this spring.

Keep a close watch for damaging insects on all vegetables and ornamental plants. Learn to distinguish between the sucking insects which require a contact spray and the chewing insects that require a stomach poison. Here is where truly "a stitch in time saves nine."

Do what trimming and thinning is necessary on shrubs AFTER they bloom. This will minimize damage to next year's bloom.

Start shaping up the hedges, especially if they were not given a good hair cut late last fall.

Edge up the lawn and borders. Neatness is about one-third of the beauty of a garden.

Do not cut the tops of tulips off until they are entirely dried up. Tulip seed pods should be snipped off to prevent their taking too much strength from the new bulbs being formed.

Make a note now of tulips, hyacinths, crocus, narcissus and other fall bulbs needed.

SAMUEL D. WALDREN

April 25th, 1944, marked the closing of the long career of one of Denver's Pioneer Horticulturists. Samuel D. Waldren worked with trees in Denver for about half a century. He trimmed and repaired trees years before the term "Tree Surgeon" was invented. He planted trees in many of Denver's parks and in every section of the city. Denver Horticulture has been much influenced by his work, and the hundreds of trees that he planted and cared for remain as living monuments to him.

CONSERVATION

of Scenic Beauty

Is one of the objectives of the

COLORADO FORESTRY AND HORTICULTURE ASSOCIATION

Cut—Courtesy Colorado Mountain Club

THE GREAT OUTDOORS

**YOURS TO ENJOY
NOT TO DESTROY**

**Preserve the Forest
Keep it clean and attractive**

ONE TREE WILL MAKE
A MILLION MATCHES
ONE MATCH CAN DESTROY
A MILLION TREES ~ ~ ~

ONE SLOVENLY CAMP SITE
SPOILS THE WHOLE TRAIL
MAKE FRIENDS INSTEAD
OF VICTIMS OF THE WILD
CREATURES ~ ~ ~ ~ ~

**YOU WANT YOUR CHILDREN
TO ENJOY THESE BEAUTIFUL
PLACES AFTER YOU ARE GONE**

The Green Thumb

A Bulletin of

COLORADO FORESTRY AND HORTICULTURE

VOLUME I

JULY, 1944

NUMBER 4



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THE GREEN THUMB

A Bulletin of

COLORADO FORESTRY AND HORTICULTURE



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George W. Kelly, Editor

4849 SOUTH SANTA FE DRIVE - LITTLETON, COLORADO

A BULLETIN
OF COLORADO
FORESTRY AND
HORTICULTURAL

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Above in simple form are the objectives of this bulletin. At present we will not attempt to cover more than those subjects which are particularly applicable to Colorado Horticulture. Subjects of general interest will be left to some of the older garden and Forestry magazines. As this bulletin is about the only publication devoted to horticultural subjects written especially for Colorado conditions, we will not have room for repetition of information found elsewhere.

For the present we plan to put out an issue every other month. It

is now up to the Horticulturists, Foresters and plant lovers in this area to decide if this publication might fill their long-felt need; and if so to get behind it and help make it worthwhile. To make this bulletin self-supporting and assure its continuance and improvement we should have a membership in the Association of a thousand or more. If each present member will tell his horticultural friends about this and urge them to send in their dues to the treasurer, we can easily reach our goal.

(Continued on page 16)

WHY WATER?

Another one of my pet peeves, as I drive around town, is the man (or woman) with a hose "sprinkling."

As this series is intended to make us think why we do things instead of doing them mechanically, let us review the reasons for watering or not watering in Colorado. By eliminating the needless or even detrimental practices we will have more time for the really necessary gardening chores.

Water, of course, is the only thing that makes most of our state anything more than a desert. But too much water, or water at the wrong time, or improperly applied, is not only waste, but many times actually does damage.

For instance take the person who believes that his lawn **MUST** be sprinkled **EVERY** day. This is a nice time killer for the business man to use after supper. He sprays water all over the lawn and flower beds. Before it has soaked in an inch the surface looks nice and muddy, so he goes in feeling that he has done a good deed for his yard. What has actually happened? The lawn has been freshed up a bit, but the water has not gotten down deep where the roots are (or should be) and by the middle of the next afternoon that water has all evaporated and the lawn is as dry as before. When this is repeated every day the grass and plants depend on this shallow water and do not develop deeper roots. Then when hot dry weather comes in fall it is impossible to keep the plants growing vigorously.

A better practice would be to

water a third or fourth of the yard each day (if you must play with the hose every day) and water that part **THOROUGHLY**. By thoroughly we mean in such a way that the water soaks way down. This will encourage deep roots, and for several days after a thorough watering there will be subsoil moisture to keep the plants growing. A sprinkler of some sort to suit the size of yard will eliminate much of the time killing "hose holding." The only way that the ground can be soaked deep is by a slow spray or going over the same place several times.

Around shrubs, flowers and vegetables where the surface of the ground is bare, this daily sprinkling tends to form a crust which helps the moisture in the soil to evaporate and retards the soaking in of water when applied.

Some plants definitely do not like too much water. Two good examples are elm trees and Colorado cedars. The soil underneath should never be allowed to become really dry, but to keep it soggy all the time is equally bad. Many plants are killed by kindness. The only way to **KNOW** whether the soil is wet enough or too wet is to occasionally dig down and find out. Some people instinctively know when to water and when not. We say that these people have a "Green Thumb". With a little study almost any of us may develop a little greenish tinge on our thumbs. (If you want to literally have Green Thumbs try pulling weeds for a while).

Protect Your Evergreens

By William H. Lucking, Jr.

Evergreens make a permanent planting if taken care of properly. Most all Evergreens have some insects or diseases which attack them. Aphids, Red Spider, Pine-borer, Scale and Spruce Gall are the most common insects that attack Evergreens.

Aphids and Red Spider give the most trouble. These two insects can be controlled very easily if dusted or sprayed in time. The Rocky Mountain Juniper or Cedar (*Juniperus scopulorum*) seems to give us the most trouble. Aphids surely love this Evergreen. One should begin dusting or spraying with nicotine early in May, then repeat every three weeks. Do not wait until your evergreens are all brown. The same treatment will take care of Red Spider, although if there is Red Spider only, often one can take a good force of cold water and wash it out. Next spring, when the trees are dormant and new growth has **not** started, lime-sulphur will be in order. A good syringing now and then will help keep all Evergreens healthy.

The Pine-borer is a most troublesome pest at times. A Moth early in the spring lays eggs in the tips of the Pine; then as the new growth starts, these eggs hatch into light brown worms called borers. They will bore down through the new growth which we call the candle. The Pine-borer can be controlled by spraying with arsenate of lead spray just before the new growth starts; then repeat again in about two weeks. In most cases, this treatment takes care of the Pine-borers.

Scale is a little white insect that attacks Spruce, Pine and Fir trees.

This insect gets on the needles, and if not controlled will cause all the needles to drop off. Scale can be controlled by spraying with Lime Sulphur early in the spring. Be sure when spraying with Lime Sulphur that it is done only when the Evergreens are dormant. Remember that the white spots on the needles of the Bristlecone Pine (*Pinus aristata*) usually are **not** scale but exudations of pitch. As was stated in last month's **Green Thumb**, the Bristlecone is the **only** pine that has this peculiarity. It is easy to tell whether or not the white substance on a Bristlecone's needles is pitch by rubbing a little off and smelling it. If you haven't sprayed with Lime Sulphur while the tree is dormant, then you can help somewhat by spraying with nicotine when the aphids emerge from their white scale covers and start feeding. It is necessary to examine daily with a magnifying glass to catch this moment.

Spruce Gall is that brownish-looking burr you see on the tips of the Spruce. It is caused by an aphid which migrates from the Douglas fir. The large eastern nurseries recommend nicotine just as the buds are starting to break in the spring. A prominent Colorado expert states that Lime Sulphur before growth has started, helps.

So in growing Evergreens one must watch for these pests, as great harm can be done in a very short time. Once an Evergreen is damaged, it is usually impossible to bring it back to its original beauty.

There is just one more Pest that is very harmful to Evergreens, and that is the Dog we'll call Squirt. That fellow can do more damage than all other pests put together. About the only remedy here is to put wire around the Evergreens to keep Mr. Squirt away.

HAWTHORNS FOR COLORADO

By GEORGE W. KELLY

Results of our survey of Hawthorns (*Crataegus*) used for landscape effects in Colorado are not as conclusive as were the results of Flowering Crabs. Hawthorns have always been difficult to identify, and authorities seldom agree on characteristics and nomenclature, so only the foolhardy would attempt to say anything definite about them.

Of 75 requests for information, only 22 returned their questionnaires. This included most of those in the state who had done much work with Hawthorns. Many were evidently afraid to stick their necks out on this difficult subject.

The species receiving most mention was *Crataegus coccinea*, or *C. intricata*, the Thicket Thorn. This is usually a rather dense, stiff, thorny, many-stemmed shrub. Most of the reports showed this as an especially good plant and very hardy in Colorado. Nine people voted for this tree, representing a total of 187 years experience.

Next in popularity was the Colorado Hawthorn, *C. coloradensis*. It is found growing along rivers and streams at lower altitudes and is very effective either in the wild or as a cultivated plant. It is perhaps the most attractive of our native Hawthorns. In the spring it is covered with a mass of white flowers, and in the fall with loads of bright red berries. The leaves are glossy green and the bare stems in winter are a shiny brown as though varnished. While its character is naturally informal it can be easily trained in small tree form. This is a tree or shrub which could well be planted by the thousand along our highways to rival the effect of

the Eastern flowering dogwood. It is, however, more difficult to transplant than many other native shrubs.

The next most useful Hawthorn reported was the Downy Hawthorn, *C. mollis*. Reports were "very good", and "extra good", with no objectionable features noted. This is one of the more treelike Hawthorns. It can be grown as a many-stemmed shrub or a small low-headed tree, or sheared in formal designs. It is one of the hardiest and fastest-growing in this area. The blossoms are good, and the fruit is large, bright red, and does not hang on long after it is ripe. Like many of the Hawthorns, the Downy has been hybridized with other species until a great variation of forms can now be found.

Not far behind the first three came the Cockspur Thorn, *C. crus-galli*. This is a distinctive type of tree, usually low, roundheaded and spreading. The flowering is profuse, and the dark red fruit, while small, is numerous and hangs on all winter. Wonderful specimens are seen along several of Denver's parkways.

Next came the English Hawthorn, *C. oxycantha* (also *C. monogyna*). Almost as many voted against this tree as for it. It is a distinctive tree when it does well, is slow-growing and more delicate in texture than many others. The flowers are beautiful and the fruit is very attractive and persistent. Its chief fault is that it is subject to blight and is rather unreliable in growth. Most reports indicated it as worth planting in protected places, but that it is not a tree to depend on.

The double-flowering red variety, Paul's Scarlet, was mentioned by almost everyone who reported, but all warned that it was very

tender and subject to blight. When a tree of this variety does make a showing it is a thing of wonderful beauty, but only a small number of those planted ever pay for their keep.

The Washington Thorn, *C. cordata* (*C. Phaenopyrum*) was rated highly by many users. It is a shapely tree, intermediate in size between the Thicket and Downy Hawthorn. Flowers, fruit and leaves are all attractive and it is generally reported as hardy.

Another native, the Small-leaved Hawthorn, *C. saligna*, rated next. It is also called the Willow Hawthorn because of its narrow leaves. It is found in west-central Colorado, and is generally a rather loosely growing small tree or large shrub. Many reported it as worthy of greater use.

The Western Hawthorn, *C. occidentalis*, is usually found on the Eastern slope in the same locations as the Colorado Thorn. It has most of the characteristics of the latter except the shiny brown bark, which is probably the only reason it rates lower.

FOREST APPRAISAL

The American Forestry Association founded in 1875 and publisher of the monthly magazine "American Forests" has a long history of progressive leadership in the field of conservation of our natural resources. It has recently launched a nationwide appraisal to determine the war's effect upon the country's forests and forest lands. The cost of doing this important job is estimated at \$250,000 and the money is being raised by contribution. The Association states that two-thirds of this amount has been promised and the work is already well organized and under way. Additional underwriting is necessary and the Association writes those interested may make a cash contribution, a pledge, or buy a Series F or G war

The shiny-leaved Hawthorn, *C. cernonis*, was reported by several as hardy and worth further use. This too is a native.

The following native Thorns were mentioned by several as worthy of wider use: *Crataegus chrysocarpa* (*doddsi*), *rivularis*, *coloradoides*, and *erythropoda*. Other cultivated Thorns mentioned by some as satisfactory were *Crataegus rotundifolia*, *punctata*, *sanguinea* and *carrieri*.

Features characterizing all Hawthorns are: a good showing of clusters of (usually white) flowers, fruit of various sizes and persistence, a habit of slow growth, deep rooting, and difficulty in transplanting. They readily cross with adjoining species making any particular specimen very difficult to positively identify. They are in general (as with most slow growing trees) real aristocrats of plants. In Colorado, where trees of bold effect and showy flowers are scarce, we could well plant many, many more Hawthorns.

bond in the name of the American Forestry Association and mail it to 919 17th Street, N.W. Washington, D. C.

Conduct of the Forest Appraisal is under the direction of Mr. John B. Woods. In the 5 Rocky Mountain states, Colorado, Wyoming, Utah, New Mexico and Arizona, the appraisal will be under the direction of J. Lee Deen of Fort Collins, Dean of the Division of Forestry and Range Conservation at Colorado State College. Dr. Deen will be assisted by Professor J. C. H. Robertson, Associate Professor of Forest Management on the faculty at Fort Collins. It is expected that work will begin in Colorado on July 1, 1944.

CHLOROSIS

DO YOUR PLANTS HAVE YELLOW LEAVES?

Cause and Cure

By **A. M. BINKLEY**, Horticulturist
Colorado State College, Fort Collins, Colorado

When something happens which prevents the formation of green coloring matter, known as chlorophyll, or something destroys it in the leaves, plants turn yellow. This "sick" condition is called chlorosis.

The small chloroplasts in the cells of leaves obtain their energy from the sunlight for combining carbon dioxide and water to form sugars and carbohydrates. A plant is largely made up of products manufactured by the chlorophyll, and when plants are very yellow there generally is not sufficient chlorophyll present for good growth. Severely affected plants may die.

Chlorosis is associated with a series of very complex chemical relations of the plant. In brief two general relations should be considered: (1), those processes involved in plant development, such as, intake of water and minerals, respiration, transpiration, storage, photosynthesis and the formation of protoplasm; and, (2) the conditions under which the plant lives, or environment. Here such factors as temperature, light, soils and quantity and availability of nutrients present, water supply, and other factors. The nutrient requirements of different plants will vary with different species, varieties or temperature or other environmental conditions. The interrelation of environmental factors and plant development can become very complex.

A Few Causes of Chlorosis

Conditions which interfere with the normal assimilation or distribu-

tion of nutrients in the plant may cause chlorosis. A few of the conditions related to chlorosis are:

1. Deficiencies of certain elements in the soil, such as nitrogen, potash, magnesium, manganese, zinc and copper.

2. The fixation or lack of solubility of certain of the elements such as iron, or phosphates.

3. Excesses of certain elements in the soil such as lime. When the proportion or ratios of certain elements to others are unbalanced poor growth may result.

4. Virus diseases.

5. Winter injury.

6. Insufficient light.

7. Excess application of water to plants. high water tables, poor drainage or lack of aeration.

The degree of chlorosis may be affected by cool temperatures which emphasize the yellow color of the foliage.

Of this various types of chlorosis, one of the most common in Colorado is the one where iron is lacking or is not soluble or available in a form in which it can be readily absorbed or used by plants. This trouble occurs where soil alkalinity is high. Sodium, potassium and calcium salts may accumulate in soils to increase alkalinity of soils. High calcium carbonate is the one salts most commonly associated with chlorosis. Apparently some plants growing in excessively alkaline soils cannot take up or utilize the iron necessary for chlorophyll formation.

Control of Iron Deficiency

1. Plant injection and spraying methods, used for diagnosis and as temporary control measures.

(a) Spray the foliage, trees shrubbery, or perennials with ferrous sulphate. Use a two per cent solution or about one pound to ten gallons of water. Do not use the Ferric sulphate salt. Apply where possible in early stages of growth.

(b) Use of dry iron salts by injection method. Drill $\frac{1}{2}$ inch holes in the main lateral roots of ornamental trees in the early spring or winter when trees are dormant. Drill holes with brace and bit deep enough to hold the iron salts and the size of drill hole should be made according to size of the tree.

Treatment when trees are growing rapidly may result in partial or complete defoliation of the tree. New green leaves may come out. Use one to two ounces of ferrous citrate per ten inch in diameter of the tree. After filling the hole with the iron salts, seal with grafting wax or asphalt emulsion. Drill as many holes as is necessary to hold the measured amount for the tree. Drill holes on different sides of the tree. Do not drill holes in trunks of ornamental trees. This treatment is not always successful on all types of trees, or conditions.

2. Soil treatments.

(a) Any practice that will maintain or increase organic matter content of the soil. Turn under legume, green manure

crops. Heavy addition of well rotted manure (do not use fresh animal manures), peat moss, compost of leaves, decomposed lawn clippings, turned under will help make iron more available.

Prepare your soil for planting trees and shrubs by heavy applications of well rotted organic matter before planting time.

(b) One pound of ferrous sulphate per square yard of soil, washed in with water, has been of value on some soil types, but generally is not satisfactory.

Under some conditions adding a mixture of equal parts of ferrous sulphate, aluminum sulphate and sulphur to the soil has been helpful.

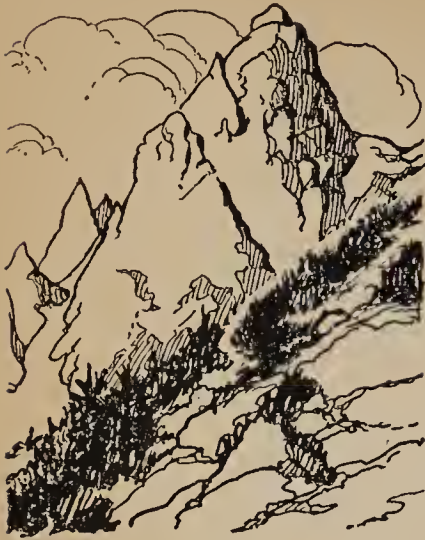
3. Plant crops, trees, shrubs and perennials and varieties of plants which are tolerant to alkaline soils and are not susceptible to lime induced chlorosis.

Treatment of deep-rooted trees for chlorosis is always difficult and any attempt to change alkalinity of soils in any large acreage to any great depth is a very slow and expensive process.

Since there are many causes of chlorosis in plants, and in some cases it is not due to iron availability, do not make large scale treatments until the trouble has been diagnosed. Try out treatments on a small scale first. Do not invest money in treatments of your plants until you have the necessary information on the cause of the condition from a reliable source.

FLOWERS ABOVE THE CLOUDS

By MYRTLE ROSS DAVIS



flowers grow. If you have climbed in this high country up next to the sky, or if you have gone to the top of Pike's Peak by automobile or by the little old cog train, you have had at least the opportunity of seeing some of these hardy little plants. They flower in a world of snow and burning sun, rain and drought, avalanche and blizzards, and many of them are exactly the same specie as those growing within the arctic circle.

In the towering rocks of the Rocky Mountains between 11,000 and 14,000 feet above the sea, the traveler finds it difficult to breathe enough of the rarefied air to keep from gasping for breath and upon the slightest exertion is conscious of his pounding heart. Strong icy winds blow; snow, hail, and sleet fall in the summertime; snow banks and glaciers remain all the year around and freezing temperatures prevail nearly every night.

Rocky Mountain sheep and Ptarmigan live up there; there is grassland or tundra; there are meadows and rock fields with environment growing steadily more severe until on the highest peaks (over 14,000 feet) arctic conditions are experienced.

As the snow recedes, these dwarf, rich-colored flowers burst into

Many Colorado people lament the fact that Rhododendrons, Azaleas, Dogwood, Laurel, Arbutus and many other beautiful flowers do not grow here. Many regions of the United States have flowers which are famous and one thinks of them as being associated with certain states or areas of the country.

The high elevation areas of the Rocky Mountains and particularly Colorado, as it has the most high mountains, should be known the world over by its Alpine flowers but for some reason these rare and exquisite flowers have missed their share of publicity.

It is on the very tops of the Rocky Mountains, in a land too severe for trees, that Alpine bloom. The yellow snow buttercups and the white marsh-marigold may be found breaking through the snow to bloom. They have no time to lose as their summer of only a few weeks is soon gone. The little bright blue Alpine forget-me-not, the moss campion with its cushion-like growth starred with pink blossoms, the Alpine sun flower with its big golden head and its covering of shaggy white hair, the mountain dryad with its eight creamy petals, the tiny gay rose-colored fairy primrose, the fragrant rock jasmine, and many more of these extremely interesting plants are at home on these stormy heights.

In July the high rock fields, which appear at a little distance to be barren wastes, will be found on close examination to be a beautiful natural rock garden; a riot of bright colorful bloom from the cushion-like plants nestling close to the earth fill the spaces between the rocks. The effect is that of a brilliant crazyquilt spread out over the mountainside.

Nowhere is the beauty of wild flowers more strikingly revealed than in the Alpine region of the Rocky Mountains. If you love flowers and if you go there to see them you will be thrilled by the vivid coloring and life these tiny

blooms give to the drab background of rock, and if you stop to think about it, you will be interested in the miracle of these little plants winning in their struggle for life on these inhospitable mountain tops.

Surely after knowing the Alpines, Coloradoans will realize that we

CANADA'S ARBORETUM AND BOTANIC GARDEN

By M. WALTER PESMAN

Does a Botanic Garden pay? Are rubber and quinine important? The Kew Botanic Gardens started the commercial growing of these plants. Are windbreaks important in Canada? Thousands of Siberian Pea Trees (*Caragana*) now growing as windbreaks in the Canadian west and the northern United States have their origin in seeds from the Dominion Arboretum on the outskirts of Ottawa, the capitol city of Canada.

Right now this same Dominion Arboretum is carrying on extensive experiments with Milkweed plants, because of the rubber and the floss that comes from them. (Oh, yes, we have milkweeds in Colorado, but no Botanic Garden!) A certain percentage of Milkweed-rubber added to Buna S. (synthetic rubber) makes it usable for heavy duty tires. What is being done now, is to breed a variety of milkweed with a higher rubber yield and of uniform quality.

In the meantime the milkweed floss has been found to be an ideal substitute for kapok, used in life preservers and life rafts. It is particularly important because it is extremely light, (having hollow fibers) and because it is coated with a sort of wax, impervious to water. Many other native plants or introduced plants may be found to be of future importance once they can be studied from the commercial and scientific angles. We may be able to "grow" our future substitutes for gasoline and alcohol,—we may find important fiber plants, food

have flowers which should make our state botanically famous. Perhaps they would not trade them for those of any other state. When adequately publicized, people may make pilgrimages from all over the world to see Colorado's flowers above the clouds.

plants, medical plants, that can be particularly well grown in Colorado. Do you know that extensive experimentation is going on now in Colorado on the culture of pyrethrum?

The Dominion Arboretum and Botanic Garden is also trying out the Russian kok-saghys dandelion for rubber. It was introduced from eastern Russia near the Chinese border. Seed exchanged with other countries was initiated by Dr. H. T. Gussow, the Arboretum's botanist-director, soon after his arrival from England in 1911. The United States and the U. S. S. R. particularly were contacted because of the similarity of climate. Russia furnished Canada with many forage and pasture grasses.

At the beginning only about two hundred varieties of trees and shrubs were grown at Ottawa,—now the Arboretum has 1,400 completely hardy specimens. Four years ago herbaceous border plants were added. Over three thousand species of woody plants were tested since the time the Arboretum was started in 1886. A beautiful park shows how these trees, shrubs and perennials can best be used.

In spite of the variable climate, from forty below to ninety-five degrees above, the Dominion Arboretum and Botanic Garden has proved its worth many times over. What unforeseen commercial values it may bring out in the future no one can tell. Its sixty-five acres, with 560 additional acres near Peterboro, Ontario, for milkweed experimentation, promise great things.

Is Our Colorado Landscape In Danger?

SCIENCE vs. BEAUTY

This association, long active in conservation, is now faced with the need for a new kind of conservation—the protection of scenery and other natural values from the ravages of a busily planning mankind which is not thinking completely enough to save the things it treasures most.

We know that big things are being planned for Colorado after the war. These include new highways, irrigation and power projects, strip coal mining, and oil shale quarrying. Frequently mentioned are the monies to be spent, employment provided, and increased populations. But we are not told that nearly every industrial and population gain entails the loss of scenery, the diminution of uncrowded and unmarred out-of-doors, and the destruction of other natural values.

As I enumerate losses we shall suffer if many post-war projects are consummated, please do not consider me an obstructionist seeking to prevent progress. If we want these things enough, let us choose them upon democratic bases, but let us approve projects only after **all** factors involved have been thoughtfully considered. If we do not no one will, for others are ignorant of the biological implications involved or are blinded by the promised benefits of good salaries and increased business.

Consider strip mining proposed for shallow coal veins in Larimer and Weld counties. From this coal, motor fuel can be distilled. Faced with dwindling petroleum stores, this seems attractive. However, in strip mining huge mechanical shovels lift away the surface of our plains on which bison, antelope, and more recently cattle have grazed. The top soil is placed upon the bottom of the adjacent strip

from which the coal has been removed. Unweathered parent soils and rocks are placed uppermost, usually in rough windrows. To replace the soil in its original order requires additional handling which the operator can ill afford. One may wonder how soon anything of value can be grown again.

Comparable are projects for quarrying mountains of oil shale in western Colorado. Thus far we have been told only of the wealth to be squeezed from the shale, and of more fuel for our motors. We have not been told of fuels which can be distilled from replaceable plants. We have not been told which beautiful mesas and canyons will be levelled into jumbled ugliness and of others which might be spared. Unmentioned is the fact that with more fuel for our motors, there will be fewer places worth driving to.

Let us consider proposed augmented irrigation for eastern Colorado, using water brought from across the Continental Divide or even from the Missouri River. Farmers already within this area have too little water during dry years. We favor giving them more water, but do we want many more irrigated lands? We can have them, but we cannot at the same time rebuild eastern Colorado's antelope and sage grouse populations to numbers again permitting regular hunting. There will be more pheasants, but we may lose original fauna now cited as evidence of unspoiled primitiveness.

Great dams and reservoirs are proposed to store water for irrigation and power production. We are told that these make beautiful lakes. They do at high water level, but when drained they reveal unsightly mud flats and broad beaches

devoid of either land or water vegetation. In depressions upon the plains, reservoirs are not objectionable, but when placed high in the mountains they kill trees with their backwaters, gouge mountainsides with ditches incidental to their use, and spoil much that is fresh and beautiful.

Colorado's duck shooters should remember that early season shooting depends upon resident ducks, and that not all ducks can nest at lakes with greatly fluctuating levels. Fishermen, nature lovers, and tourists should remember that more reservoirs and transmountain diversions will dry many streams—in some places seasonably, in others for as long as such works remain. An aimlessly growing civilization may demand more of these dammed projects, and short-sightedly fail to realize the destruction involved.

Then someone can always think up a new highway project. Fishermen are still trying to catch up with good fishing, just now beyond their reach, by building faster roads to it—and the good fishing moves on. There are just three ways to obtain superior fishing:

1. Buy a place, fence it, stock it, and post "keep out" signs.
2. Climb, pack, or fly into inaccessible places the other fellow can't reach.
3. Spend more time traveling to and from fishing than the average fisherman can spare in his week-ends off.

Time rather than distance is the determinant of good fishing. If better fishing is wanted near Denver, let the roads deteriorate. Then one need not travel so far, but the good fishing will still begin beyond where Tom, Dick, and Harry can reach during days off. Or, if we double Denver's population and make Colorado's roads faster and more numerous, we can chase the

good fishing clear out of the state. Before we do, we'd better make sure that neighboring states are saving some for us.

Circle drives advocated by planners in tourist towns should be scrutinized. If improperly located these may obstruct the down country migration of elk and deer, ruin the last extensive range upon which a band of bighorn sheep depends, or break the only remaining wilderness the region can boast. Before such roads are built, landscapers should consider the natural beauty threatened and biologists should weigh their effect upon forest types and wildlife. Without such precautions we may sometime find more tourists to brag to, but have less to brag to them about.

We have too many poorly planned roads which have ripped the heart from attractive canyons—either through the process of their construction or by shedding great quantities of water into streams already inclined towards disastrous floods. Finally in respect to roads, we have missed some implications. Few realize that some highways make big cities greater and villages smaller. This is not good, for we realize that small communities are credited with the finest contributions to citizenship.

Indeed, most problems we are considering result from the wishes of great populations or from steps taken to attract more people to this state. Many believe that great populations are desirable. There are, of course, four recognized advantages:

1. During wars, greater populations can produce larger armies and more military equipment than less populated areas can provide. However, after this war, we may succeed in ending wars.
2. The largest and best known stores and factories—whether

locally owned or part of a chain—grow with populations; and the top positions in such enterprises grow in consequence and remuneration.

3. Great cities can build and maintain more imposing public buildings and monuments than are found in smaller communities. Such structures are admirable, but they may explain why many city folk, impressed with the works of man, forget the great natural forces at work in the world.
4. Large communities near others of great size attract and enjoy great artists of music and the theatre, great art collections, and great libraries.

And yet large cities have disadvantages. They attract increasing numbers of thoughtless people against whom "keep out" signs are erected upon our countrysides. Sordidness unalleviated by nature becomes more common, as do criminals and other undesirable folk. Finally the very people who advocated making our towns larger consider them unfit places for living, and move to the edge of town or adjacent villages.

Increasing populations change states from producing to consuming areas, and prices of foods and other commodities rise until distress increases among the resident poor and gains among the more favored are nullified.

Residents of growing cities must travel increasing distances to still enjoyable scenes and ride perforce in long queues of motor cars upon our highways. The irritable haste resulting explains the bad public manners common to many residents of great cities. Fish and game populations become inadequate for sport except upon a restricted or artificial basis. Yet how often Western cities entice more residents by telling of the rich outdoors

nearby, even though each new resident diminishes the favorable balance between outdoor resources and users! How often those who do not understand Nature speak of creating a new Pittsburgh of the West, and in the next breath boast of western outdoor wonderlands! Who will tell these ignorant people that Nature cannot forever withstand any and all abuses?

Great cities imitate the metropolitanism of larger cities more than they seek to preserve or accent the culture of the region they dominate. Names rich with local meaning become submerged among names made common by national advertising or among theatre, restaurant, and other names aping in a meaningless fashion those found in even more metropolitan areas.

Some have insisted that populations are bound to increase, and that we can never stem the rising tide of people, but we now know that the rate of increase is dropping. I dare prophesy, too, that we shall eventually pay more attention to great populations than to merely keep in mind that they vote.

Some endangered natural values must be treated individually. For example, 18 miles northwest of Ft. Collins is a northernmost pinyon grove meriting mention in Sargent's *TREES OF NORTH AMERICA*. This unusual grove in a charming country grows upon a low limestone mountain. The limestone is necessary for use in sugar factories and cement plants, for which it is being quarried. This is State land—a school section—and its exploitation has been arranged between the factories concerned and those who handle our State lands. No general attempts have been made to preserve remnants of this pinyon grove as a state forest, park, or monument.

* * *

What shall we do about these

things? It is easy to rant about something needing improvement, but do we want action? Does this newly combined association want a program which will make it vital? Then listen.

Colorado has state planning committees upon agriculture, industry, and forests. Some of these deal with recreation and outdoor assets. But what we need is a committee which will, as its sole purpose, catalog and evaluate the natural values of scenery, wildlife, pioneer relics, and traditions which attract a tourist business ranking high among state incomes and, more important, which make life here worthwhile.

Just as some committees are asking how many people Colorado agriculture and industry can support, a committee upon natural values should ask how many people can live richly in Colorado. From such studies should come publications listing the natural values of Colorado, stating what uses the various ecological types can support without diminution, naming the activities which threaten to destroy our natural values, and listing specific areas and projects needing detailed analysis and preservation.

Then, once we all are acquainted with the whole picture, we should make some intelligent choices. We can expect opposition to such a program, just as the conservation organizations which questioned the transmountain diversion through Rocky Mountain national park were criticized. But, as the result

of questioning concerning this project, safeguards were provided. The level of Grand Lake will not fluctuate. Tunnel exits and entrances are located outside important park areas. Every precaution not to mar the surface of the park has been taken.

All proposed projects must be studied before plans for them are completed. Engineers work with obstacles, and once a project is planned will toss aside all hindrances, including those who question project design. To be effective we must be in on the planning, before estimates are made.

The tempering of all engineering projects with provisions protecting natural beauty will not please those whose fetish has been the greatest sum of money derivable from any scheme or efficiency for efficiency's sake. They may ask us to point to any civilization which has prospered by sacrificing maximum mechanical efficiency and money-making for love of countryside beauty and traditions. I can think of a very gallant ally which has done just this, and am sufficiently American and tintured with bloodstreams other than English that I dare point to England without prejudice.

Many people have condemned England for not having materials with which to fight, but no one can honestly accuse her of not having things worth fighting for. And seriously, Ladies and Gentlemen, I would prefer to fight with inferior weapons than to have nothing very much worth fighting for.



QUERCUS QUIPS

RE-LANDSCAPING THE SMALL HOME

Editor's Note: We are happy to announce that we have secured a new contributor who will favor us with articles from time to time. His name is Quercus (pronounced Querr-Cuss) and he is somewhat of a landscape gardener, very much interested in things botanical, distinctly a fussbudget, and occasionally fairly interesting. Articles signed by him express his opinion and do not necessarily represent the policy of the Association. Let us know how you like his writings.

Thirty years ago most novels ended in the promise to marry on the part of the theretofore capricious heroine. Once she gave her consent, apparently all interest in life ceased, all problems ended. The current books on "Landscaping the Small Home" (and they are legion) approach the subject much as did the novels of 1910—once the home is landscaped, the story might as well end. A trip through any fifteen or twenty-five year old residential section, however, establishes that problems continue to arise.

With the new place everyone is so eager to get a "quick showing, and the average nurseryman is so anxious to turn his stock before it gets too large, that most small places are overplanted. Once the material takes hold and starts growing vigorously, the overcrowding becomes critical. But the owner either doesn't notice the place any more or, if he does, he can't bear to take anything out that is growing nicely. So year by year the trees and shrubs get larger, the grass gets thinner, the flower beds get poorer and the shade, instead of being an aid to comfort, becomes an instrument of gloom.

Yet neither gardening book nor horticultural magazine seeks to arouse the complacent householder from his lethargy and start him anew on that most fascinating of all pursuits, the planning of an attractive and restful yard. (If I ever speak of the "Outdoor Living

Room" or "plunging pots" may I be shot dead!). Strangest of all, why do not the nurserymen see the possibilities in this most promising field? Had I a nursery, I should leave the doorbell of the recently constructed home strictly alone. The chances are ten to one the owner has already spent fifty per cent more than he can afford on the house. But the place that needs RE-landscaping! Ah! that is a different story. The owner has recovered from the financial shock of building; he is older and probably better to do; he is just the right girth for real benefit from gardening; and he perhaps has more appreciation of beauty, if stimulated, than your younger chap.

Let us be more concrete. Fifteen years ago John X. Bridgegroom built a seven-room house on a tract 75 x 125 feet in a pleasant part of the city. Across the back he planted a row of Bolleana Poplars that was intended to furnish a "screen". They do. The screen is now forty feet high, no afternoon sun can touch house or back yard, and suppurating, greedy roots cross the entire yard in their never-ceasing search for food and water. The lawn is bumpy with them; the flower beds are robbed by them, and, if in desperation he raises his eyes above the depressing ground, he sees the corroding cankers on the trunk discharging gangrenous pus.

The worst is over, but the rest is

none too good. The "foundation planting" covers most of the windows, and the shrubs are old and leggy. A couple of Chinese Elms in the parking knock off hats from pedestrians, spread litter everywhere in the spring, and constantly break—but do not die—when their persistent leaves are caught by out-of-season snowstorms. The owner struggles valiantly with these trees, and instead of being ashamed of their ragged shape and ugly scars, tells you with pride that he saved one of them, after tree experts told him it was a goner, by pouring copious quantities of water into two drain tiles (which, God bless him, don't come even close to any vital root on the tree!).

John called on a couple the other day who, curiously enough, had included landscaping in their budget when they built three years before, and who now have, therefore, a lovely exterior. A brilliant Pin Oak gleamed red in the waning October afternoon, keeping the direct rays from becoming oppressive, but not as yet spreading to proportions that are out of scale. The screen of shrubs, now some five to

six feet high, gave privacy, but was neither heavy nor oppressive. The virile young branches, clothed to the ground with deep green, vigorous leaves, are a pleasure to look at. The foundation planting is a mixture of dwarf shrubs and evergreens which (has "tie the house to grounds" already become too hackneyed? Probably so)—keep the house from looking raw and incomplete.

This strange couple have no parking trees, thereby ensuring an uninterrupted sweep of lawn from street to shrub plantation. (Why do we need parking trees anyhow?).

Of course the hosts want to show John and his wife everything, and as John feels his feet sink into the lush turf, and stops to admire the rich flower borders, he suddenly realizes how drab his own place is.

If John and his wife can but have courage, their happiness is secure. They must grub out **every** existing tree and shrub, however. Then let them start from itch (for itch comes before scratch), re-landscape their house, and have for themselves a truly attractive home.

TELL YOUR FRIENDS

Blanch M. Richards, Membership Chairman.

Membership in an organization such as the Colorado Forestry and Horticultural Association is both an honor and a privilege. An honor because this association is one of the oldest, if not the oldest organization in Colorado. It was begun by our early pioneer builders, because they saw a great need for the protection of our forests which were rapidly being cut for mine timbers, railroad ties, and log cabins and being destroyed by fire. They too, saw the need for the protection of our water sheds; water so valuable to a dry, arid land such as Colorado was at that time. Through the splendid work of this organization we have been given the added protection of the national

forest system.

Since wood has become the source of so many vital products, it is still necessary to keep a watchful eye on our forests. By becoming a member of this organization you can individually or through organizations encourage soil conservation and the general protection of forests in Colorado. In return you will be helping to leave a useful and lasting beauty in the state for generations to enjoy. You will receive correct horticultural information on planting in Colorado's climate through the organization's bulletin "The Green Thumb."

Send your membership NOW to the treasurer, Mr. W. J. Ise, 831 14th St., Denver.

PINYON PINE

Robert E. More.

The Colorado Pinyon Pine (*Pinus cembroides edulis*) has a wide distribution in Colorado, coming into the South and West from Utah, Arizona and New Mexico, and extending to Wyoming on the north, and Owl Canyon, near Fort Collins, on the east. At Owl Canyon are found specimens that are, perhaps, the finest in the world. The patriarch shown in the illustration is the largest reported Pinyon Pine. It is about 25 feet high, has a crown spread of 31 to 37½ feet, and a trunk circumference of 11 feet. The Forest Service estimates that it is 600 to 800 years old.

As is well known, the Colorado Pinyon Pine has edible nuts that are prized by confectioners. The wood is used considerably for fuel, and small trees are employed frequently in the Rocky Mountains for informal landscaping effects. The short needles (an inch to an inch and one-half in length) come two or three in a bundle, are yellowish-green on the dorsal side, and somewhat silvery on the ventral, or inner, side, due to the presence of many white stomata or pores. The tree is slow growing, and our smallest pine tree at ma-

turity. Young trees for landscaping can be obtained at most nurseries, either with single stem and somewhat regular form, or multiple stems and informal shape. Small trees can be kept in scale for many years by cutting off the top third of each "candle" after elongation is complete in the spring, just before the needles are ready to "break". (This same practice on White, Austrian, Mugho and other Pines will prolong their "landscape life" many years and make them more compact and beautiful trees).

If exposed to south and west sun and wind in winter and spring, the Colorado Pinyon Pine sometimes scorches somewhat, particularly the first year after transplanting. This is particularly true with stock originating in the Southwest. Probably seed collected from the Owl Canyon trees would produce a much better tree in this respect, as conditions there are very similar to those found in Denver. The tree is thoroughly hardy in any Colorado temperature, and deserves a more prominent place in landscaping than it has heretofore been accorded.

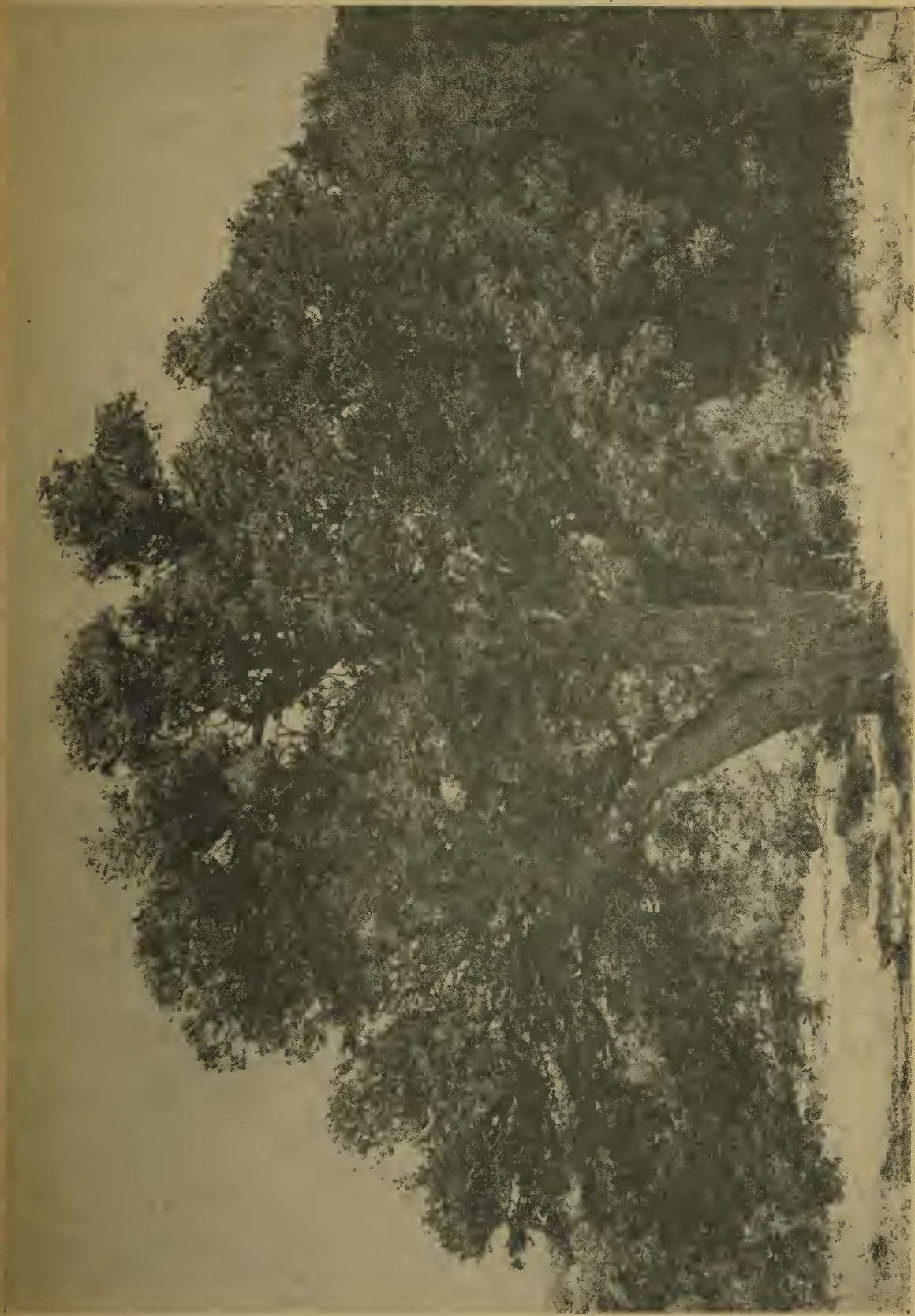
EDITORIAL

(Continued from page 1)

We want you to feel that this is **your** magazine, and send in your suggestions for its improvement. What subjects would **you** like to see presented in these pages? What are some of your particular problems? If your requests are for information of general interest we will attempt to have some expert who is qualified to do so tell about it in an early issue. If your problem is not of general interest we will attempt to get you in touch with some one who is qualified to answer you personally.

We would especially appreciate your sending in interesting items on any of the above 7 Ps subjects. Things which interest you might interest others. We would like to have each one of our members send us details of any unusual tree or shrub that they know of. When time permits we would like to compile a list of all these unusual plants so that others might become acquainted with them.

At present all the editorial work and mailing is done by volunteers. If you would like to help please let the editor know.



PINYON PINE

Photo. by U. S. Forest Service

GARDEN CALENDAR — JULY AND AUGUST



This is the hottest, driest season of the year. Watch your watering carefully. Water thoroughly when you do water. This applies to trees, shrubs, perennials and lawns. Plants will dry out more in a few days now than in weeks during spring. Check especially those trees and shrubs which were set out this spring. Don't be fooled by water standing on the surface after a short watering. Dig down occasionally and **BE SURE THE WATER GETS DOWN TO THE ROOTS.**

Check over your garden for weeds left during the earlier weeding. A few plants of dandelion, wild lettuce or parsley left now to go to seed will cause much work next spring. Weeds rob the adjoining plants of moisture much needed now.

Continue to cultivate. Cultivation accomplishes several things. It eliminates the weeds, lets air into the soil, keeps the surface loose so that it absorbs water more easily, prevents some evaporation of moisture already in the soil, and leaves the garden easier to work next time.

In many places a mulch can be applied which does most of the things that are done by cultivation, and in addition adds fertilizer to the soil. This is Nature's way. Notice the deep leaf-mould in the forest.

The fight against insects is on now. Learn to know the different types of insects and the remedy for them. Watch especially for indications of aphids or spiders on junipers. Nicotine sulphate will get the aphids and dusting sulphur the spiders. A hard force of cold water every few days will help control both. Bugs on squash and pumpkins can do a lot of damage in a short while now. Hand-pick or use powders recommended by your seedsman. Fight the leaf-hoppers on Engelman Ivy and grapes. Covering the under side of the leaves with arsenate of lead will help. Here also a hard force of water will remove many.

Check over your yard and trim back the rank growing shrubs that are damaging the nearby finer shrubs. Most shrubs should have necessary pruning done on them soon **after** they bloom. This interferes the least with next year's bloom. Cut back the long heavy limbs of Chinese Elm in anticipation of the early snows.

Plant vegetables for late use and storage; beans, beets, carrots, winter radishes and Chinese cabbage. Move a few new plants from your strawberry bed to a new location.

Transplant oriental poppies when they are dormant in August. Peonies may be divided and moved then too.

Dig, separate and replant tulip bulbs which have been undisturbed for several years and have divided. They do not need to be left out of the ground to dry, but may be replanted at once. Plant them deep for best bloom and less dividing. Order any fall bulbs needed now; tulips, narcissus, hyacinths, etc.

Set the mower a little higher when mowing the lawn. Let clippings fall at least half of the time. Water thoroughly. Don't let dandelions go to seed.

Trim your hedges frequently. It is the only way to have a dense hedge. Edge the lawn around your beds and borders. Neatness is about one-third the beauty of a garden.

Clean up stems of plants which have bloomed and died down. If not full of disease and insects put in a compost pile. Now is the time to make arrangements for a good compost pit. There is nothing our Colorado soil needs worse than the humus from manure, peat and compost.

Watch for signs of Chlorosis especially in maple trees. This yellowing of the leaves usually indicates a lack of something in the soil. It may be supplied in various ways. Frequently iron sulphate applied in bar holes under the trees help. This subject is explained in this issue.

Take time now to check up your garden for improvements in associations of plants. Do colors clash? Do certain plants tend to crowd out others? Are there vacant places? Are there some plants that you do not like? Look over your neighbor's yard for nice things that you would like.

Gather seed of flowers and vegetables. If you have several varieties of one kind, chances are they will be mixed, but may still be good for planting next year.

Now is the season of the year when we should take more time to enjoy our gardens. We may relax our efforts a little and look around us. Just stop, and sit, and enjoy sometimes. Visit other gardens for the enjoyment of their beauty, and for good ideas you can gather.

The Green Thumb

A Bulletin of
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Photo. by U. S. Forest Service.

THE GREEN THUMB

George W. Kelly, Editor

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Organized in 1884

"To preserve the natural beauty of Colorado; to protect the forests; to encourage proper maintenance and additional planting of trees, shrubs and gardens; to make available correct information regarding forestry, horticultural practices and plants best suited to the climate; and to coordinate the knowledge and experience of foresters, horticulturists and gardeners for their mutual benefit."

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PINES FOR COLORADO

ROBERT E. MORE

As was done with Flowering Crabs and Hawthornes, questionnaires on Pines were sent to nurserymen and other experts throughout the State. Since Pines vary greatly in form and size, perhaps the most helpful way to classify the returns from the questionnaires will be to group the trees according to height.

LOW PINES: As is pointed out by Hornibrook in his *Dwarf and Slow Growing Conifers*, "The dwarf pines are not very numerous." Only three have been tried in Colorado, namely, the Mugo Pine (*Pinus mugo mughus*) the Globe Austrian Pine (*Pinus nigra globosa*) and the Dwarf Swiss Stone Pine (*Pinus cembra pumilla*). The last has proved unsuccessful in the few instances it has been tried.

Apparently the source of the seed of the Mugo Pine is of great importance, for this tree is very variable. The color runs from a light yellow green to a dark blue green. If left absolutely untrimmed, the maximum height will be anywhere from four to fifteen feet. However, not only may growth be retarded by cutting off in the spring a portion of the "candles" (the elongated new growth just before the needles sprout), but this is one of the few evergreens that will sprout new buds when old wood is cut. Accordingly, its top can be sheared as one shears a hedge. Thus even faster growing varieties can be kept in bounds for years by regular pruning in the spring.

To establish that the tree is usually hardy for Denver requires only a trip through our Parks and residential sections. However, the answers on

questionnaires disclose that it sometimes scorches and sometimes fails, especially in the South. It is not as hardy as our native trees and should not be utilized in southern Colorado or the mountains, unless protected from snow scald, and spring sun and wind. One variety is a dwarf and it should be requested when a low plant is needed.

The Globe Austrian Pine is very slow growing and certainly has performed well when tried and warrants a trial by nurserymen. It is still experimental so far as amateurs are concerned, however.

MEDIUM PINES: These grow to a height of six to twelve feet during their normal life in cultivation. The Colorado Pinyon Pine (*Pinus cembroides edulis*) is enthusiastically recommended by all who have had experience with it. This tree was fully described in the last issue of the "Green Thumb."

By letting a Mugo of the larger type grow unchecked, an evergreen bush, ten or twelve feet high can be obtained in a reasonable time, so the Mugo can be utilized in the "medium" group as well as the "low" group. There are many nice specimens around the Museum of Natural History in City Park.

The Japanese Table Pine (*Pinus densiflora umbraculifera*) has nicer foliage than the Mugo, but usually needs much more coddling in Colorado than most people care to give, and was seldom recommended in the questionnaires.

LARGE PINES: Four trees in this group were recommended by all

who had ever tried them, namely, the Ponderosa (*Pinus ponderosa*), the Austrian (*Pinus nigra*), the Limber (*Pinus Flexilis*) and the Lodgepole (*Pinus contorta latifolia*). The questionnaires ranked them in the order just given.

As the Ponderosa is the common tree of our foothills, it was to be expected that more of the persons interrogated would be familiar with it than any other tree, and such was the case. However, wherever actual comparisons were made, the Austrian was preferred. In addition, it is a smaller tree than the Ponderosa and keeps its lower branches better. The Austrian is the Pine most frequently found in our Parks and Boulevards. There are magnificent specimens in City Park and along Seventh and Seventeenth Avenue Boulevards. As the Austrian and Ponderosa Pines somewhat resemble each other, it may be of interest to indicate distinguishing characteristics. Our Austrian Pines have been identified by Professor Rehder as the variety *Pinus nigra austriaca*. The crown of this tree is usually round, while that of the Ponderosa is pyramidal. The cones of the Austrian are smaller, and usually without spines, while the Ponderosa cones always have sharp bristles on the cone scales. The Austrian never has but two leaves in a bundle. The Ponderosa sometimes has but two, but usually has three. The needles of the Austrian are darker in color. The bark of our Austrian Pines is gray, while that of the Ponderosa is black in youth, and brown in maturity. The

winter buds of this Austrian Pine are sharp pointed and almost white, those of the Ponderosa blunt and brown. The same color differentiation is found on the sheath enclosing the bundles of newly formed needles.

The Limber is a grand tree, the typical form of which at maturity is shown on the cover. On mature trees the branches usually "reach up," as shown in the illustration. The largest known Evergreen in Colorado is a Limber Pine the trunk of which is almost 19 feet in circumference.

The Lodgepole has a bright yellow-green foliage that is fine for forming contrasts. Unless given plenty of light and room, however, this tree does not reach its best development.

The White Pine (*Pinus strobus*) is probably the most beautiful one of all. The silky fine needles, regular growth up to maturity, and attractive bark, make it a joy to behold. Both the needles and the bark are subject to sun scald in Colorado, however. As the tree grows older it becomes less susceptible to sun rays. In a protected location it generally does well. Persons unfamiliar with the beautiful grove on the east side of Downing street just north of Speer boulevard should certainly go by there. This tendency to scorch in the spring caused many of those returning questionnaires to select the Limber Pine in Place of the White. They are quite similar in appearance while young. The growth on each should be retarded in city plantations.



Photo. by C. Carl Davis, from "Meet the Natives."

SIMPLE KEY TO PINES

(Native to or appropriate for Colorado)

In the November, 1943, issue of *Arnoldia*, Dr. Donald Wyman, Horticulturist of the Arnold Arboretum, Harvard University, published a "Simple Key to the Pines." We have been given permission to reprint this "Key." We have omitted, however, the trees that are known to be unsuited to Colorado.

Dr. Wyman states (we have added the comments in parentheses):

"This simple key is offered chiefly for the benefit of the amateur gardener who is frequently confronted with complicated keys which he finds to be too difficult for his purposes. The key is based primarily on foliage characters which, in most cases, can be observed without the use of a hand lens. It should be clearly understood that any key based primarily on the length of the leaves—and this key is just that—is open to serious criticism because the length of the leaves of any plant will vary with the individual as well as with soil and climate variations, disease infestations, age and altitude at which the tree is growing. Other plant characters vary likewise. However, in order to assist the gardener who has an interest in pines, this key is offered in spite of such just criticism. * * *

"All measures of leaf length should be considered as approximately only. On one individual tree needles may vary in length from 2 inches to as high as 8 inches, but in the key the length given would be 4 to 6 inches, meaning that *mature* needles—not the young ones which are elongating, nor the ones on weak or on over-vigorous branches—are mostly within the 4 to 6 inch length. If this is clearly understood by those using this key, the key will undoubtedly prove helpful in the identification of most of our commonly grown pines.

"The key is designed to be used chiefly with living material, hence the color of the foliage and the general habit of the tree sometimes plays an important part.

"Hardiness is given according to Zones in the Hardiness Map. (See *Rehder's Cultivated Trees and Shrubs*). Habitats are also given, because sometimes such information may prove helpful in assisting in plant identification.

"Identifications made by the use of any key, and this one in particular, should not be considered final, but should be further checked against a complete description in some standard text, and available illustrations."

Needles in bundles of 2 to 5, rarely solitary, enclosed at the base by a deciduous or persistent sheath.....*Pinus*—Pine.

1. Needles 5 in a sheath

2. Needles usually less than 1½ inches long with smooth margin.....
.....*P. aristata*—Bristle-cone Pine.
California to Colorado, Zone 5 (In Colorado this tree is usually found in Zone 3. Elevation 8,000 to 12,000 ft.)

2. Needles usually 1½ to 2 inches long.

3. Bark of trunk brown to creamy white, needles rigid and stout, margin smooth.....*P. albicaulis*—White Bark Pine.
Zone 3 British Columbia to California. (This tree is common in Wyoming)

3. Bark of trunk black, needles more flexible; needles light green, not twisted, mature twigs glabrous, needles smooth. (Elevation in Colorado 7,500 to 11,500 ft.).....*P. flexilis*—Limber Pine.

2. Needles mostly $2\frac{1}{2}$ to $4\frac{1}{2}$ inches long; leaf margin serrulate, i.e., rough to the touch.
 3. Mature twigs glabrous; branches horizontal, tree open, cones usually 2 to $4\frac{3}{4}$ inches long; twigs glabrous or only slightly pubescent.....
.....*P. strobus*—Eastern White Pine.
Eastern United States and Canada, Zone 3.
 3. Mature twigs pubescent; tree densely upright, pyramidal in habit.....
.....*P. cembra*—Swiss Stone Pine.
1. Needles 3 and 2 in a sheath
 2. Needles less than 2 inches long.....*P. cembroides*—Mexican Pinyon P.
Southern California and Arizona, Zone 9 (Our Colorado Pinyon Pine—*P. cembroides edulis*—which is found in Zone 4, can be included here. Elevation in Colorado 4,000 to 9,000 ft.)
 2. Needles more than 2 inches long; one-year buds yellow-brown to brownish; terminal bud very resinous....*P. ponderosa scopulorum*—Rocky Mountain Ponderosa P.
Rocky Mountain region, Zone 4. (Elevation Foothills to 9,000 ft. in Colorado.)
 1. Needles 2 in a sheath
 2. Needles $\frac{3}{4}$ to 3 inches long.
 3. Foliage bluish-green, bark of upper trunk red *P. sylvestris* and varieties—Scotch P.
Europe, Zone 2.
 3. Foliage green.
 4. Plant usually shrubby, with several main branches from the base.
 5. Needles $\frac{3}{4}$ to 2 inches long, bark black..*P. mugo* and varieties—Swiss Mountain P.
 6. Dense, almost globose shape.....*P. mugo compacta*—(Mugo P.)
 6. Shrubby, upright habit.....*P. mugo pumilio*
 5. Needles 3 to 5 inches, bark red to reddish.....
.....*P. densiflora umbraculifera*—(Japanese Table P.)
 4. Plant a tree with central leader; needles mostly 1 inch long.....
.....*P. banksiana*—Jack P.
Northeastern United States and Eastern Canada, Zone 2.
 3. Foliage yellowish-green, needles, $1\frac{1}{2}$ to $3\frac{1}{2}$ inches long. (Elevation 8,000 to 10,000 ft. Usually in dense stands. Tall slim, cones persistent.....
.....*P. contorta latifolia*.)
 2. Needles 3 to 8 inches long; winter buds resinous; needles stout and stiff, stiff, breaking when bent.....*P. nigra austriaca*—Austrian P.
Central Europe, Zone 4.
 - (1. Needles 1 in a sheath, *P. cembroides monophylla*, One-Leaf Pinyon Pine; Southern Colorado and to the Southwest.)

Contented Earthworms Make Contented Gardeners —or Is It Vice Versa?

Editor's Note: With this issue we introduce another new contributor who prefers to be known only as John Stockbridge. He presents some interesting ideas which should interest all horticulturists.

If you have seen an earthworm writhing in contact with some fresh 4-12-4 fertilizer, you can realize that earthworms certainly applaud and gardeners can well be interested in the theories of a magazine called "Organic Gardening," published at Emmaus, Pa. Another name for the principle involved is Bio-Dynamic Gardening.

The idea is that chemical fertilizers kill earthworms and that earthworms are essential to proper preparation of soil, mixing fine particles of earth and humus, and aerating the ground. Wild, untamed earthworms are probably entirely okay for this purpose, but one advertiser in Organic Gardening offers "domesticated earthworms." And you can get good, hardy earthworms from the Ohio earthworm farm whose product is "seasoned to hard winters and summers" (which may be a crack at a California competitor).

The main thing is to be kind to your worms (earthworms) and not to destroy them or drive them away with chemical fertilizer. Instead, you fertilize entirely with properly made compost, thereby providing a more abundant life for your worms (earth) and growing foods which are richer in vitamins on plants which defy disease and laugh at pests. You can also grow your own earthworms by proper planning.

Patron saint of the organic movement seems to be Sir Albert Howard, whose Indore process of making compost is considered tops. It's worth trying, especially if you need compost soon while it ordinarily takes you a year or two to make it. Use any garden waste, but let green material wilt before you compost it. The pile should preferably be on brush, or a constructed foundation that lets air circulate at the bottom. Pile the waste about six inches high, but don't tread

or crush it down. Then put on two or three inches of fresh stable manure or waste from a fish market or garbage or what have you, plus an inch or two of the best topsoil you can get. Repeat the operation for two or three more layers. Sides as well as top of the completed pile should be covered lightly with topsoil. If the pile is very wide, arrange ventilating chimneys in the middle, to be sure the air goes through the pile. Then (and this is the trick in a Colorado climate) keep the material as wet as a squeezed-out sponge, but not any wetter. Never let running water drain nutrients away. After four weeks, turn the pile inside out. After three more weeks, turn it inside out again (or outside in, you might say). Five weeks later, the compost is ready and should be used at once. Don't worry about seeds and disease in your refuse: the heat of decomposition takes care of such things.

Of course, there are fine points and refinements and choices of material and recommendations for various dimensions and a surprising amount of comment, experience and experiment—enough to fill a respectably sized magazine and to fascinate anyone who has studied soil building or fooled around with compost and artificial manure. Personally, I'm not sold to the point of throwing away my modest collection of chemicals, because I've seen an obviously healthy and apparently happy earthworm getting along nicely in ground containing a comparatively fresh mixture of 4-12-4. However, bio-dynamic ideas are easily tested. Half of a vegetable patch or flower bed can be treated exclusively with naturally composted organic wastes, the other half with your favorite chemicals. By the second season, you should find this interesting segregation: fishing worms in one end, bean beetles in the other.—John Stockbridge.

HARVESTING VEGETABLES

A. M. BINKLEY—*Horticulturist, Colorado State College.*

High table quality in vegetables means attractive appearance; freedom from blemishes, due to insects, diseases or bruises; high edible flavor and texture; low paring waste or high percentage of edible use and uniformity in size and maturity. In harvesting for high quality it is necessary to understand some of the factors which enter into quality in vegetables.

Quality is affected by (1) the varieties and strains planted; (2) by the environment and growing practices used; (3) by harvesting and handling methods which is related to the changes which take place during ripening or maturing of a product. These are briefly discussed here for what value they may have in providing a better understanding of harvesting.

1. Varieties and strains planted. Varieties are now developed for specific purposes, such as canning, quick-freezing, storage, home use, and for shipping long distances. Know the high quality varieties:

(a) Appearance — Color, finish, etc.

(b) Table quality—Low percentage of waste and ease of preparation, good flavor and texture.

(c) High yielding ability.

2. Environmental and cultural practices affect quality at harvest time.

(a) Soils and climatic conditions, etc.

(1) Deficiencies or excesses of nitrogen, phosphorous and potash or other elements. Low nitrogen in the soil may produce stunted plants that are tough and fibrous; excess nitrogen may delay maturity and stimulate heavy vegetative growth, etc.

(2) Over-irrigation or lack of sufficient and uniform application of water may cause a product to be tough or delay maturity.

(3) Temperature — While it cannot be controlled, dates of planting and other cultural practices can be adjusted to work with the temperature requirements of special crops. High temperatures may shorten and low temperatures may delay ripening of some crops.

(b) Disease and insect injury.

Damage by disease and insects causes loss in edible quality, waste in preparation for processing and table use and poor keeping quality in storage.

3. Harvesting and handling methods affect quality.

The changes during the ripening or maturing stage of growth are important to harvesting at the right stage of growth. These changes are:

(a) Increase in size. All melons, tomatoes, squash.

(b) Development of color as in tomatoes.

(c) Increase in sugar content during ripening as sweet corn, peas or melons.

(d) Deposit and storage of starch —potatoes.

(e) Increase in fiber as in asparagus.

(f) Softening of tissues; change on pectins and carbohydrates.

(g) Changes in acids or bases. Increase or decrease, depending on the product.

(h) Flavors develop rapidly (cantaloupes).

(i) Moisture content may decrease or increase.

(j) Seeds mature in certain products.

Changes in tomato fruit during ripening is discussed for an example, since changes vary with the product. As tomato fruit ripen there is a (1) slight increase in water content (2) increase in sugars (very rapid), (3)

slight increase in acid (about .5% citric acid), (4) decrease in starch, (5) decrease in crude fibers, (6) decrease in nitrogen, and (7) decrease in solids. Each vegetable could be so discussed. In harvesting four factors should be considered. These are (1) sizes, weight and dimensions; (2) maturity—stage of growth or development a product has attained to be usable; (3) condition—refers to the character of a product as modified by time, temperature, and other factors during and after harvest; (4) color—appearance as an indicator of maturity.

Not all human tastes are the same and each person should be allowed to select the stage of maturity at harvest time, the variety and condition which he likes best. Here are a few of the points to look for on a few of the specific crops:

1. SNAP BEANS (Dwarf type). Pods straight, smooth, round, meaty and succulent; absolutely no strings or fiber in the pod. Do not delay harvest until the seeds are fully matured. *When seeds are about one-fourth mature is better.* Dark green color after processing is desirable.

2. BEETS. Free from blemishes, smooth, round. *Deep dark red interior, free from white ring zones.* Should retain table quality over a long period of time. Free from coarseness or fine texture. 1¼-inch to 2-inch diameter for bunching.

3. CABBAGE—Solid when mature. Uniform size, freedom from insect injury and large cores, and have good color. Late varieties should have good keeping qualities.

4. CARROTS — Uniform, well-shaped, cylindrical roots, free from blemishes. *Deep, dark orange color, very small core and it should be the same dark orange color as the rest of the root.* ½-inch to ¾-inch diameter at crown.

5. CAULIFLOWER — *Heads short, compact and free from leaves; riceness or fuzziness and as white as possible.* Free from bitter flavor. Curds compact and hard to firm.

6. CELERY—*Stems free from heavy strings, crisp, brittle, thick, not flat, and properly blanched.* Pascal types not being bleached to the extent it was before the war.

7. CUCUMBERS (slicing)—Smooth, well formed and dark green in color. Round in cross-section, *small seed cavity, thick walls, firm, crisp and tender.* Free from bitter flavor.

8. WHITE POTATOES—Smooth, *free from blemishes,* shallow eyes, good shape for variety, *low paring waste and good boiling, baking and frying characteristics.* Late varieties should keep well in storage.

9. HEAD LETTUCE — *Hard, solid, heavy, and free from tip burn browning on margins of leaves.* Flavor free from bitter tang; no discoloration; no slime or rots. Dark green wrapper leaves.

10. CANTALOUPE — *Flesh thick, fine textured, good orange color, not mealy or rubbery.* Seed cavity small. *Netting, raised round and well developed above the skin, crease in netting, closed.* The stem

should be fully slipped from the fruit. This is the full slip stage of maturity when the fruit is ripe. Flavor spicy but not strong. Avoid fruit with soft blossom ends, and those that show flat netting, which may indicate immaturity or that they have matured on dying vines.

11. ONIONS (Dry)—Bulbs uniform in size, shape, color. Free from neck rots and blemishes. *Well matured and dry for storage.* Flavor on Sweet Spanish, mildly pungent and sweet. Wrapper scales heavy for storage.

12. POD PEAS — Dark green color, pods and peas; *pods well filled not over mature*; shell easily; free from pod damage; uniform filled pods; flavor rich, not starch. Harvest and process immediately.

13. PEPPERS—*Large size, open cavity with thick outer walls.* Desirable shape and size. Flavor mild.

14. TOMATOES — Fruits medium size; smooth, free from splitting and cracking, *uniform ripening to deep dark red color.* Avoid over size fruit. Both inner and outer walls of fruit should be thick; interior meaty and juicy, but not too soft. *Fruit should have depth from blossom end to stem end.*

15. SPINACH — Vigorous and rapid growth important. Leaves large, crisp, thick, free from discoloration, insect or disease damage, and free

from dirt. Deep, dark green color is desired.

16. SWEET CORN — Ears should be uniform in size and color; husks fully covering ears, especially at tips; *ears well filled, not over mature.* Hybrids should ripen ears uniformly. Flavor sweet and kernel skin tender for canning or quick freezing. Process as soon as possible after harvesting. Yellowkerneled types favored. Check maturity carefully when harvesting. High temperatures increase rate of ripening and sugar to starch changes.

17. WATERMELONS — Variety difference in adaptation important here. Fruits should be well formed, good size. Flesh deep, dark red, fine texture and free from fibers. Size or outside color of fruit not good indicators of maturity. *The area of the melon resting on the soil should be creamy yellow in color and the skin should be tough there so it cannot be easily dented by thumb nail.* By tapping melons, hollow metallic sound indicates immaturity and a heavy sound indicates ripeness. Color, sugar content, and flavor do not increase after harvest of watermelons.

18. WINTER SQUASH—Flesh should be dark orange color, fine textured, good flavor; free from heavy fibres and have good keeping qualities in storage. Avoid storing cut, bruised or damaged squash. *Outer shell should be hard and dry before storing.*



AVEN NELSON

PIONEER ROCKY MOUNTAIN BOTANIST.

Altho Dr. Aven Nelson's home is in Wyoming, we think of him as belonging to the Rocky Mountain Region and not to any one state in that region. Many years ago the Herbarium at the University of Wyoming, which he founded, and of which he was curator and now is curator emeritus, was formally named "The Rocky Mountain Herbarium. So also the manual of which he is the co-author with the late John M. Coulter, is titled, *New Manual of Botany of*

the Central Rocky Mountains.

Aven Nelson was born on a farm in southeastern Iowa in 1859 and he has charmingly described his early years in these words: "From childhood up I may classify myself as a 'nature lover.' My father's little hilly wooded farm was to us children a botanic garden. There was real competition in the finding of the first wind-flower and spring beauty. We had folklore names for many others. By the time I was a full farm hand

my curiosity extended to the gorgeous flowers that thrived in the protected corners of the zig-zag railfences. At 17 I was a full-fledged country school teacher. Friday afternoons we took time off for 'nature work,' and I raced up and down the hills and ravines with my whole flock, in hot pursuit of the birds and the flowers. By that time, I had armed myself with a copy of Gray's Manual (6th edition). This, however, was a disappointment, for it was the first and only book on systematic botany I had ever seen. Nothing had led up to the vocabulary that I encountered."

From country school teacher, Aven Nelson went to the Missouri Normal School, and on Commencement day left for home "in possession of a normal school bachelor's degree, a life state teacher's certificate, a gold medal won in an 'oratorical contest,' a girl to whom he was engaged and whom he subsequently married, and a job."

From normal school he went to Drury College, where later he was drafted to teach elementary botany. He says, "I assure you it was elementary indeed. The course drifted into a sort of a glorified course in nature study. I discovered, as doubtless some of you have, that in the absence of knowledge, enthusiasm will do much to cover up the deficiency." In that statement Dr. Nelson has perhaps given us the key to his continued youthful outlook upon life which endears him to all who know him—his boundless enthusiasm for his work.

In 1887 he heard of the proposed state (territorial) university that had reached the incubation period. He decided to go and grow up with the institution. Of his early days in Wyo-

ming he says, "I entered on my work in Wyoming with utterly inadequate preparation. My total library in botany was Gray's Lessons and Manual, to which I soon added Doctor Bessey's College Botany, then rather recently on the market. It was a revelation to me, for up to that time I had only casually heard of algae and fungi. I had never used nor owned a microscope. No money was available at the infant college for equipment or books. After two years, a doctor on the university board sold me his personal instrument for \$20."

Four years later when the Agricultural College and U. S. Experiment Station were added to the institution, the new duty of botanist of the station was added to his already varied load. He asked for a leave of absence for a year to study at Harvard, which was granted—*without pay*. He received his master's degree from President Elliot the following June.

Back in Wyoming Dr. Nelson set out in 1892 to build a department and a botanical library. During his absence Prof. B. C. Buffum, who had substituted for him, had collected extensively and had made up some hundreds of very creditable herbarium specimens. Nelson was asked to name them and get an herbarium under way. He accepted the challenge, and of these days he says, "I had to begin at the bottom. I had no conception of families, to say nothing of genera and species. Provided with a dissecting microscope, forceps and needles, a bottle of water, an alcohol lamp, some watch glasses and a test tube in which to boil up the dried blossoms, the work was on. . . . The whole setup also got me into trouble with the family—I'd often forget to go home to my meals. . . . Each sum-

mer, with the members of my family in a big camp wagon, we scoured the plains and mountains for more treasures. In no sense, however, were these field trips primarily pleasure trips—we labored like harvest hands, for all expenses had to be met from the sale of duplicate sets. Fifteen to twenty specimens of each number was our objective. Thus the work went on for many years. . . . The job then and always that kept bread and butter on the table was teaching; the things I did when I could do as I pleased were field and herbarium work."

Thus we see enthusiasm at work building a great herbarium—which today is the outstanding herbarium between the Mississippi and California.

Aven Nelson is today President Emeritus of the University of Wyoming, Curator Emeritus of the Rocky Mountain Herbarium, and is a Past President of the National Honor Society, Phi Kappa Phi. He is happily married to Ruth Ashton Nelson, author of our indispensable *Plants of Rocky Mountain National Park*.

To quote Selma U. Grout, of the Colorado Mountain Club, "Those of us who have been privileged to work under him or to accompany him on field trips, know his enthusiasm and his interest in everything and everyone around him. His droll remarks, his teasing smile and his impish twinkle are delightful, and his patience and consideration of the most ignorant beginner have endeared him to many."—*Kathryn Kalmbach*.

MRS. RICHARDS LEAVES

Colorado lost one of her most ardent boosters for Forestry and Horticulture when Mrs. Clarence M. Richards recently moved to California. She has been active in promoting things horticultural for a score of years. About 10 years ago she served as president of the Colorado State Forestry Society (The first and only woman to be thus honored), and was on the board of directors of that organization until it was changed to the Colorado Forestry and Horticulture Association. She continued as a director of this organization and served as chairman of the membership committee.

She was a member of the Home Garden Club of Denver since its organization in 1925, and served as its president from 1931 to 1934. She served as president of the Colorado Federation of Garden Clubs from 1936 through 1938. The plans and practices that she initiated for these groups will effect their work for many years to come. She was largely responsible for the establishment of the Garden Center at Alameda and Kalamath streets and was always working for such things as highway beautification and parks.

Dignity and ability qualified her as a leader; affability and a willingness to serve when needed brought her popularity and recognition. She proved that "He who makes a garden makes O, so many friends."



QUERCUS QUIPS

"NATIVES"

Editor's Note: Here is another article by Quercus. It represents his personal ideas and the association or editors disclaim any responsibility for the conclusions herein presented. How does it strike you. Let us know in a short statement. We will publish those replies of most interest.

A couple of years ago about eighty of us visited a private botanical garden in Jefferson County. Our host took a somewhat smug pride in the fact that there was no shrub or flower on the premises that was not a "native." (He was inconsistent with his own plan, however, because he had evergreens from everywhere.) The collection was interesting botanically. But from an aesthetic point of view it could have been improved by the addition of domesticated plants. I have always felt that the preference for "natives" was based on sentiment rather than sense. There are, of course, some native flowers that will hold their own in any company in the world. Our Blue Columbine, the Mariposa Lily and the Wood Lily, the Yellow Water Lily, the Fringed Gentian (when growing in quantity), and the dainty Calypso are all gems. Some of the Alpines—if you are willing to crawl on your hands and knees—are lovely things. But by and large their cultivated cousins have a lot more to offer. And in the shrub group, I wouldn't give a dime for

more than four or five of our natives. The Colorado Dogwood is a good shrub and the same is true of a couple of Haws. The Golden Currant isn't bad, and the Mountain Ash (if you can transplant it and get it to bear fruit) is lovely indeed. In general, however, native shrubs are leggy, skimpy of foliage, unimpressive of bloom, and hard to get started. With respect to flowers, compare a native Iris with an Elmohr or a Prairie Sunset, a drab mountain Gailardia with its gorgeous city sister, a Wild Rose with a Hybrid Tea. You take the muddy, stinking Parry Primrose, and I'll take Primula Auricula Alpina, giant hybrids. What plant of the wild can match the Peony? How about Glads, Dahlias and Zinnias? In the Clematis group, would you prefer a stringy Alpina from the hills, or the large flowering or English hybrids?

Meet the natives, but choose the educated plants as your friends. They not only are better dressed and more intelligent, but they endure longer.



MEMORIAL FORESTS

Memorial groves in memory of men who have lost their lives in military service have been advocated by a number of individuals and organizations. This is a worthwhile movement which should receive every encouragement. Some memorial groves and individual trees were planted after World War I. Undoubtedly some of these have been forgotten or neglected; perhaps some or all of the trees have died.

The Forest Service maintains a memorial grove at the Monument Nursery near the town of Monument, Colorado. A report on this grove may give encouragement to those who are thinking of starting similar projects. After World War I, individual trees were planted at ranger stations and at various places on the National Forests. It soon became evident that these trees would not have lasting value as memorials, because most of the trees were not marked and the records regarding them were buried in the files. The significance of some of these trees was soon lost.

Accordingly, it was decided to have one community grove for all Forest Service employees in the Rocky Mountain Region. On May 30, 1921, a group of forest officers and their families assembled at the Monument Nursery for the planting and dedication of 30 trees in honor of forest officers who had died since the Forest Service was started. This included five men who lost their lives in World War I.

Since that time, 42 trees, mostly Colorado blue spruce, have been

planted—a total of 72 trees—in the memorial grove. The trees are irrigated and cultivated until they are thoroughly established. Some of the older trees are 15 to 20 feet in height. Aesthetically, the grove is a beautiful addition to the nursery. Practically, it serves as a wind break to the adjacent seed beds from the winds that sweep down from Mt. Herman, towering high above the nursery. Each tree is marked with the name of the individual and date of his death. A map on which each tree and the name is charted completes the record and with attached instructions insures that, despite changing personnel as time marches on, the grove will be maintained for posterity.

Fred R. Johnson.

BOOK NOTES

Edible Wild Plants of Eastern North America, by Fernald and Kinsey, 1943. Idlewild Press, Cornwall-on-Hudson, N. Y., \$3.00. Useful also for our Region.

Wild Fruit Recipes. The Farm Kitchen, Farm Journal, Philadelphia 5, Pa. 15 cents.

Herbs easy to grow in your Victory Garden, for flavoring, for fragrance. 55 actual prints of these herbs. The Botanic Publishing Co., Cincinnati, Ohio. 15 cents.

Key to some Colorado Grasses in Vegetative Condition, by H. D. Harrington and L. W. Durrell. Technical Bulletin 33, June 1944, Colorado Agricultural Experiment Station, Colorado State College, Fort Collins. Excellent illustrations.

PLAIN FACTS ABOUT FORESTS



Some of the most frequently misunderstood facts of the forest situation in the United States have been listed by the Forest Service, U. S. Department of Agriculture. These misconceptions, with the truth in each case are:

One-third of the United States is forest land so there always will be plenty of timber . . . Fact is, of 630,000,000 forest land acres in the U. S., 168,000,000 are not suited or available for growing timber, 77,000,000 are virtually non-productive as a result of destructive cutting and fire, and all but 100,000,000 of the rest has been cut over and produces only a fraction of what it might.

Eleven billion cubic feet of new growth occurs each year—so we shall always have an abundance. . . Fact is, nearly 17 billion cubic feet, or 50% more than total growth, was cut or destroyed in 1943, while in sawtimber alone drain was almost twice annual growth.

Only about 2% of the sawtimber stand is cut annually so the supply of some 1,764 billion board feet should last 50 years—even if there was no new growth. . . Fact is, the cut for lumber is only 60% of total yearly sawtimber drain, while only about two-thirds of the supply, or

thereabouts, is accessible to loggers at reasonable cost.

Millions of trees are being planted . . . True—but up to 1940, all agencies, public and private, established only 3½ million acres of successful plantations, while the National Resources Planning Board sees a 25-year, 32-million-acre planting program as necessary to meet the nation's "most urgent" tree-planting needs.

Public control of cutting practices on private lands—would that not conflict with freedom of enterprise? Fact is, proposed public regulation would require owners only to cut timber according to rules established through thoroughly democratic processes, but would not touch the question of when to cut or how fast. They would stop forest destruction and deterioration and keep the land reasonably productive.

These frequently misunderstood forestry facts are discussed, along with other pertinent present-day forest problems, in Miscellaneous Publication No. 543, "Some Plain Facts About the Forests". A free copy may be obtained from the Forest Service, 403 Post Office Building, Denver, Colorado.

EDITORIAL

We have been receiving some very good comments about our new bulletin, *The Green Thumb*, which we appreciate greatly. Some have been kind enough to offer valuable suggestions for improvement. We would appreciate any other suggestions. Much more material has come in for publication than we will have room for at once. Many new members have come in in the last two months but we will need many more if we are able to publish all the good articles that are available.

We are very sorry to have made a serious omission in the last number. Credit for the impressive article, "Is

Our Colorado Landscape in Danger?" should have gone to Prof. J. V. K. Wagar of Colorado State College.

We also failed to give credit for the fine picture on the front to Andrew Fielding, and to the Colorado Mountain Club for permission to use the cut.

We will have some fine things ready for the next issue. Look for them. We would appreciate suggestions from each member as to what subjects and authors he would like to see in the coming issues.

GEORGE W. KELLY.



ARE OUR ELMS IN DANGER?

There has been some discussion among horticulturists living in Denver about the seriousness of the damage done by elm scale to our elm trees. We plan to have a discussion

of this problem by leading experts in coming issues. There is no doubt but that this is a serious threat to our trees and action of some kind should be taken at once.

Victory Garden Show



"No Victory Garden is complete without a few flowers; no Victory Garden Show can be complete without the beauty and fragrance of a floral exhibit," says C. M. Drage, Extension Horticulturist.

For this reason, a floral department has been added to the Denver Victory Garden Show, August 30, 31 and September 1, Annex City Auditorium.

Ribbons provided by the Colorado Forestry and Horticulture Association will be awarded for the best single specimens of roses, dahlias and glads as well as for the best collections of named varieties of roses, dahlias, gladioli, chrysanthemums, perennials and annuals. Ribbons will also be awarded for the best spray or sprays of fruit, the best table arrangement, best tall arrangement and for the best arrangement of fruit.

MEETING OF THE ASSOCIATION SEPTEMBER 7

The program committee is working on plans for a general meeting of the membership Sept. 7. Detailed plans will be given later, but it will probably be a picnic with a botanical walk, and speakers in the evening. Richard White from Washington, one of the highest authorities on post-war planting has promised to talk to us at that time.

GARDEN CALENDAR, OCTOBER, 1944

OCTOBER is the month of harvest, "when the frost is on the pumpkin and the fodder's in the shock." It is well to let up on the watering some before frost and let the plants ripen up, but be sure that all trees, shrubs and perennials are thoroughly watered before they freeze up for winter.

OVERHAUL Prepare both vegetable and flower gardens for winter. Move out some of the rank-growing or undesirable plants, and get in some of the nicer, new things that you have seen and read about. Pot up a few plants of petunia while you are cleaning up and take them in to a sunny window. They will bloom all winter.

COVER Soon will come the frosty nights when partly tender plants such as roses should be protected. Mulch around the perennials. Mulching helps to prevent damage from sudden changes in temperature to the soil around plants.

TRIM Trees should be gone over now to prevent snow damage. Chinese elm are especially subject to breakage. Cut back long heavy limbs. All trees may be trimmed now except Maple. Most shrubs are best trimmed just after they bloom. Set the lawn mower to trim the grass a little higher now.

ORDER Make out lists now of the seeds, bulbs, trees and shrubs needed for next year. Get your order in at once for all bulbs such as tulips and narcissus, hyacinths and crocus. Many are scarce. Keep the other lists until time for ordering in fall or spring.

BURY Vegetables such as cabbage, carrots, beets, and turnips may be buried in pits for later use. Parsnips are better if left in the ground all winter. Carrots will keep crisp until spring if put in a box of damp soil in a cool place. Pumpkins and squash will keep until after Thanksgiving in a cool well ventilated place. Green tomatoes can be brought in and ripened for several weeks. Onions and gladiolas may be thoroughly dried and kept in some place just above freezing. Dahlias must be kept "just so"; not too dry or wet, hot or cold.

ENRICH Arrange to get manure, leafmold, peat or composted leaves to spread on your garden. Where the ground is used for annuals it may be spaded in now to save time in spring and increase decomposition. Commercial fertilizers had better wait until summer.

REPAIR Before winter sets in repair and paint fences, sheds, garden tools and furniture. Level up walks and platforms. Old lawns may be reseeded or resodded now.

GARDEN CALENDAR, SEPTEMBER, 1944

Frost can be expected sometime in September. It will put a stop to the growing of all tender plants. It is then time to begin to harvest and clean up for the season. There is still much gardening work to be done. Don't let your interest lag now. To make it easy for you to plan the necessary fall work we have arranged an easily remembered list below.

STUDY If you would like to develop a Greener Thumb plan now to take up some phase of horticulture for study this fall. While the successes and failures of this year are fresh in mind, decide that you will learn more of the "why" of growing things. It may be that you are most interested in roses, or evergreens, or insect control, or fertilizers. Get all the literature available on the subject and "go back to school" this month.

ENJOY The most strenuous work of spading, weeding and watering is now about over. Take time to straighten up your back, look around you and enjoy the results of your season's work. Arrange convenient seats where you can sit and see your garden. Look over the gardens of your friends and neighbors. Arrange for a picnic of several Green Thumb friends and their families.

PLAN Now is a good time to make notes ON PAPER of things that you want to improve another season. When the gardening fever hits you next spring it will probably be too late to move plants. Now is the time to make definite plans for new plants and new arrangements of existing material.

TRANSPLANT Many perennials should be moved now. Such rampant growers as shasta daisies and iris can be divided now before they crowd out nicer things. Many other perennials have bloomed and can be moved to more appropriate locations. If it becomes necessary to move peonies, oriental poppies, bleeding hearts, rhubarb or asparagus it should be done in the fall. Some shrubs and evergreens can be moved now if it is necessary and if they are carefully handled. It is much better, however, to wait until they have become dormant. If tulips, narcissus and other fall bulbs have been in for several years and need dividing, now is the time to do it. They may be planted right back in their new locations.

ENLARGE Fall is a good time to make arrangements for larger areas to accommodate those features which are most wanted. Take out a useless poplar and make more room for garden. Add a strip of lawn where weeds once grew. Lay a good flagstone walk, or add a needed platform, wall, pool or fireplace. Put up some bird shelters and feeding platforms. New lawns may usually be successfully planted between Aug. 15 and Oct. 15.

MULCH Vegetable and perennial tops will soon be dead and may be cut off: tree leaves will soon begin to fall and lawn clippings will accumulate. Unless full of insects and disease save all these. Use what is necessary to mulch around perennials and shrubs, and pile the surplus in an odd corner for future use. The decomposition of the compost pile will be hastened by keeping it moist, by turning it over every few weeks and by allowing ventilation under the pile through an old pipe or tile. Proper mulching will do much to correct our two greatest gardening difficulties in Colorado: plants drying out in winter, and the lack of humus in our soil.

BURN The smell of burning leaves is always the sign of fall. We all get the urge to clean up now, but consider carefully before burning any leaves or plant tops. If they are infested with disease or insects, burn them, but otherwise save every scrap for mulch and compost. Don't forget the few weeds like dandelion, dock, wild lettuce and parsley which have been missed and are now in seed. Digging them out and burning them will prevent a lot of weed seedlings next spring.

EXCHANGE Revive the old gardening custom of swapping. Take a newcomer some of your surplus perennials, and learn new tricks in gardening from him. Exchange some seeds of your fine zinnias and beans for some of your neighbors squash and cosmos. Save seeds of extra nice plants for your own use next year and as trading stock.

RAKE Of course we rake in fall. A little cleaning up now will last all winter. Nothing improves the appearance of a garden more than keeping it neatly raked. Save all leaves and plant tops for the compost heap. A few old dead stems and rubbish look bad, but it is not necessary to keep every single leaf off a lawn or rake everything out of a flower bed. Let the winds scatter and pile a few leaves where they will.

The Green Thumb

A Bulletin of
COLORADO FORESTRY AND HORTICULTURE

VOLUME 1

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TREES IN WINTER

By IRVIN J. McCRARY

THE GREEN THUMB

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4849 South Santa Fe Drive

Littleton, Colorado

Mrs. Paul H. Hadley, Associate Editor

A Bulletin of the

COLORADO FORESTRY AND HORTICULTURE ASSN.

Organized in 1884

"To preserve the natural beauty of Colorado; to protect the forests; to encourage proper maintenance and additional planting of trees, shrubs and gardens; to make available correct information regarding forestry, horticultural practices and plants best suited to the climate; and to coordinate the knowledge and experience of foresters, horticulturists and gardeners for their mutual benefit."

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Tentative Outline Submitted by The Colorado Forestry and Horticultural
Association to Mayor Stapleton, August 16, 1944

In Re

THE DENVER ARBORETUM AND BOTANICAL GARDEN

The Association urges the early creation of "The Denver Arboretum and Botanical Garden" as a Living War Memorial and Public Park. To that end it suggests that adequate acreage now owned by the City and not in use along the Platte River Driveways lying North of Overland Park and to the West of the golf course be set aside for and dedicated to that specific purpose.

Following the general plan of the Washington Arboretum in Seattle, containing two hundred sixty acres, and the administrative plan of The Colorado Museum of Natural History in City Park, Denver, it is suggested:

(1) That the Denver Arboretum and Botanical Gardens be developed as a Living War Memorial Public Park and that funds be made available by the City to install the necessary improvements, irrigation and lighting systems, walks, roads and waterways and to provide an annual appropriation for proper maintenance and for policing the area;

(2) That the Denver Arboretum and Botanical Garden Foundation be organized, not for profit, to plan and administer the War Memorial under the direction of not less than fifteen Trustees who are representative and interested citizens of Denver — said Trustees to be originally appointed by the Mayor but to be self-perpetuating thereafter, which body will be charged with the duty of—

- A. Preparing the plans for the Arboretum and Botanical Gardens;
- B. Executing the same as funds are made available;
- C. Supervising and directing operations and maintenance, includ-

ing selecting and employing the Director and his staff;

- D. Interesting the general public and encouraging its participation in the development of the Gardens;
- E. Soliciting supplemental funds therefor, gifts of plant collections and individual specimens through various types of membership at large, memorials, and ultimately for endowment.
- B. Contracting with the University of Denver and/or other institutions of learning to furnish their technical staff or staffs for the carrying on of scientific study and experiment, and conduct of classes and lectures on Silviculture, Horticulture and Gardening, and if expedient, to assign thereto detailed administrative and technical control of such parts of the Botanical Gardens as may be desirable for the carrying on of particular research.

The Colorado Forestry and Horticulture Association calls attention to the attached list of reasons, among many more, why the City should create an Arboretum and Botanical Garden as a public asset and as part of its postwar planning. We believe the initial step of setting up a proper organization, dedicating adequate acreage to its use and preparing general plans for its development as an entirety should be undertaken without undue delay.

If on or before January 1st, 1945, the City of Denver shall have taken these initial steps and shall have legally created the Foundation, appointed its Trustees and irrevocably dedicated to its use adequate acreage, The Colorado Forestry and

Horticulture Association will thereupon make a donation of \$5,000 to the Foundation for the specific purpose of meeting its costs, covering the preparation of general plans for the landscaping and improvement of the area, including walks, roads and waterways, lighting, water and drainage systems, green houses, sheds and equipment, said plans to be conceived, studied, and prepared for a finished whole or entity—yet follow-

ing which plans various units of the enterprise may be constructed from time to time as funds therefor are made available—with the general good faith understanding that the City will furnish sufficient funds to the Foundation during 1945 to enable it to make a not too modest beginning of an Arboretum and Botanical Garden which will be an appropriate War Memorial and a credit to the City of Denver.

Functions of an Arboretum and Botanical Garden and Certain Advantages, Among Many Others, to Be Derived by the Public Therefrom

1. To make a comprehensive collection of trees and woody plants, to label them properly and arrange them according to their botanical relations, for the purpose of scientific study and permanent control;

2. To increase the productivity and economic importance of the area by introducing species which have not been grown here before;

3. To encourage the study of taxonomy and evolution as a basis for important commercial and utilitarian developments in agriculture, forestry, horticulture, pharmacy and botany;

4. To provide an authorized quarantine station where importations may be held under observation long enough to make sure they are free from blights and pests such as earwigs and white pine blister rust;

5. To provide a place for the horticulturist to introduce foreign species and the formation of new varieties;

6. To provide a testing ground for nursery men;

7. To provide a laboratory for students of botany for the study of plant habits and plant relations;

8. To provide training in various forms—in Forestry, Horticulture and

Gardening and secure placement in employment with emphasis upon the needs of returning veterans;

9. To provide opportunity for plant lovers to learn to recognize plants and know them by their correct names. They will also learn the requirements for the successful cultivation of their favorite varieties;

10. To provide recreational opportunities for the public. The Arboretum and Botanical Gardens will offer unusual facilities for physical and mental recreation—physical from the use of the paths and waterways, mental from the stimulus to the powers of observation, and the pleasure of learning to know and recognize plants of the world;

11. To provide a bird sanctuary—waterways will offer protection and peaceful surroundings for wild waterfowl. The entire area will be filled with song birds.

12. To provide an additional attraction for tourists. Great public interest will center in the Arboretum and Botanical Garden and as a Living War Memorial large numbers of people will be thereby attracted to Denver.

SURVEY OF ELM TREE SCALE

A group of tree experts in conjunction with City Forester Joseph A. Bixby and members of the U. S. Forest Service have just made a survey of the scale on Denver's American Elms. Full details of this survey will be published in *THE GREEN THUMB*. As this issue goes to press complete returns have been made on only the Park Hill district and one or two others.

With the exception of the parkways on 17th Avenue, Forest Street and Monaco Boulevard, the situation in Park Hill is little short of deplorable. 17th Avenue Parkway trees were pruned and sprayed by the City last spring, and these American Elms are in splendid condition now. With a few exceptions, however, the American Elms that are not on these boulevards and parkways and subject to City maintenance have been badly neglected, and unless they are

drastically pruned this fall and winter and thoroughly sprayed with a miscible oil spray next spring, *before* leafing out, irreparable damage will result.

In the Montclair area no trees were found which were entirely free from scale, and many were very heavily infested.

In University Park all American Elms were affected by scale, and those around the older homes badly.

The north side of East 7th Avenue, between Pennsylvania and Josephine Streets, had but slight infestation, whereas 40% of all trees were heavily infested between Grant and Corona Streets on both sides of 16th Avenue.

As soon as the survey is completed city officials will notify all property owners whose trees should be sprayed.

EACH ONE GET FIVE

New members are needed if this organization is to reach the objectives for which it is striving. There are thousands of persons in Colorado who would appreciate being members, if someone would tell them about it, and how to join. The people who can be expected to do the best job of bringing in new members are the present members. Therefore, your membership committee would like to have each member take the responsibility of trying to bring in at least five new members. It will be easy.

Approach men and women who are interested in growing things and tell them about this association, its objectives and benefits. Tell them about the "Green Thumb" the only horticultural magazine devoted exclusively to the subject as it pertains to Colorado and the west. Send their name, address and one dollar for a year's membership, or five dollars for a sustaining membership to Mr. W. J. Ise, 831 14th St., Denver 2, Colo.

Don't put it off. Write down the names of your prospects *now* and see them, write them or telephone them as soon as possible.

—The Membership Committee.

EUROPEAN ELM SCALE

F. HERBERT GATES, State Entomologist

European Elm Scale (*Gossyparia spuria*) as the name implies, is probably an introduction from Europe on Nursery stock and was first noticed in the United States in 1884, in Winchester County, New York; later reported from Massachusetts and District of Columbia. In 1894 it was reported from California, and later from practically all western States. The insect now is most generally distributed.

DESCRIPTION

The adult females are readily recognized by the white cottony fringes or rings around the oval dark reddish brown bodies, and measure from 3 to 4 m.m. (.08 inch) in length and are generally found on the hard wood of the trees.

LIFE HISTORY

The insect has but one generation each year. Beginning in May and through August, the eggs are deposited under the female. These eggs hatch in a few hours and crawl to the leaves, usually the mid-rib. This is known as the crawler stage.

FALL AND EARLY WINTER

Partly grown second instar insects migrate to twigs and become established in the cracks, crevices and the base of over wintering buds.

LATE WINTER AND EARLY SPRING

Molt to third instar (both males and females are produced, males do not resemble females but look more like minute flies). At this period mating takes place and the females settle down on twigs and limbs. (This is the time for effective control.)

SPRING AND SUMMER

Beginning in May and through August, eggs are deposited under the female and, as stated before, hatch in a few hours and migrate to the leaves.

NATURE OF INJURY

First notice of injury is the "black, sooty, sticky" appearance of the tree. This sooty appearance of the tree is the result of a secondary mold that grows on the "honey dew" secreted by the adult scale.

It is at this time that the lawns, walks and automobiles are dirty and sticky and people say the "trees are bleeding."

HOST PLANTS

European Elm Scale attacks all species of American Slippery, Cork, Scotch and English Elm; also in those areas where Chinese Elms have been planted, many trees being now so heavily infested as to discourage further plantings.

METHOD OF DISTRIBUTION

Infestations in new localities occur

chiefly through importation of infested nursery stock. In those areas infested, distribution and reinfestation are by means of—

1. Wind blown insects and infested leaves.
2. Scale crawling from tree to tree.
3. Carried by ants that attend them for the honey dew.
4. Carried on the feet of birds and squirrels.
5. Movement of infested nursery stock.

METHODS OF CONTROL

Successful control depends upon a knowledge of the "Life History" of the insect and in availing ourselves of this knowledge to apply control measures at the correct time, which measures consist primarily of spraying.

SPRAYS

Oil—Miscible oil and Oil Emulsions are the most effective method of control.

Miscible Oil should be used at the rate of 1 gallon to 15 gallons of water.

Oil Emulsion should be used at the rate of 1 gallon to 25 gallons of water. However, since there are several companies manufacturing spray oil, it is advisable to follow the directions of the manufacturers.

"Never apply spray oil in the winter or during freezing weather." The most effective time is late winter or spring, just before foliage starts.

WATER

Water Spray may be applied just before foliage starts as at this time the activity of the tree and the insect are aroused, the female scale entering adult life as the buds are forming. The insects are large and plump and white ringed by the time the elm seeds begin to fall; this is about two weeks before the leaves appear.

The insects are easily dislodged and destroyed at this time as there are no leaves on the tree to interfere. It has been found that ordinary pressure from the hydrant, a solid stream of water will dislodge insects 10 feet from the nozzle. For trees over 20 feet high, the city fire engine or high pressure spray outfit can be used. Care should be taken to hit the tree from all angles.

CITY OBLIGATION

The elm is one of the most valuable and popular shade trees. The appearance of a city or town is greatly enhanced by fine trees and the loss of a tree is not only a loss to the owner but also to the community, just as a loss by fire except that there is this difference: "You can replace a building in a short time, but to replace a tree takes twenty years."

FOUND: THE TRUE POISON OAK?

By JOHN STOCKBRIDGE

This department ignores anonymous communications but, on behalf of three bitterly attacked friends, it cannot ignore the anonymous diatribes of one *Quercus*, writing in the September issue of this journal.

Friend No. 1, attacked for advocating natives and importing evergreens from the four corners of the earth, is the proprietor of Glenmore National Park. He has dissected, analyzed, planted, seeded, slipped, produced, studied, described, killed, transplanted, nurtured, and, some say, invented evergreens of every known race, color, sex and condition of servitude—every species known to man and many which are not! Surely, this *Quercus* must be devoid of all human sympathies to speak with disrespect of a man like that!

Friend No. 2, attacked for being suspected of being fond of native plants just because he knows all about them, is a man who, like Friend No. 1, is often himself suspected of being *Quercus*, just because he is articulate. Friend No. 2, for all I can see, either was attacked or attacked himself just because a native is a native, whether it be ragweed or Mariposa lily. And here comes *Quercus*, assailing this highly educated naturalist and botanist just because he is so highly educated!

Friend No. 3 cannot speak for herself, and must be defended in more detail. She is the Wild Rose. (Our sexing is sentimental.) And she is attacked because *Quercus* doesn't like her! Now, it so happens that the Wild Rose is one of comparatively few roses that are worth bothering about. She adorns the face of nature. She doesn't fit in a formal garden because true, natural beauty is out of place there. She is fragrant, as a rose should be. Her bright foliage in summer and her bright pips and stems in fall and winter make her independent of her lovely blossoms,

and enable her to lend beauty to any environment the year around, while her hybrid tea and other cousins are heaped with manure and covered with burlap in order that their lives may be preserved for another summer of weekly sprayings and daily prayings that they may bloom as well as their feeble constitutions permit before the last of their dull, brown leaves is overcome by bugs and blights.

I once had the privilege of traversing eastern Nebraska and eastern South Dakota in June. It was not what I'd pick for a vacation or horticultural sight-seeing tour, but the beauty of the exquisitely tinted wild roses along the roadsides compensated for the journey. Wishing to add this striking coral color to the other wild roses which mean so much to me, I inquired at several of Nebraska's big nurseries, without success, for plants. People just wouldn't buy 'em. So the nurseries use them for understock of roses that don't have any business in Nebraska, and sell them to people who don't have any business trying to grow them. The nursery people readily agreed that the Wild Roses were prettier than the things they had to graft on to them, but pointed out that a nursery is the public's servant.

Anybody can grow wild roses. I am sure *Quercus* and some others can also do nice jobs with hybrid teas, but I advocate a law forbidding most people even to try.

And so *Quercus* comes along and castigates my three friends! Which leads to a line of speculative thought. For years those who know have decried the popular appellation of "Poison Oak" for poisonous sumac. Possibly the popular notion is right. Perhaps there is a true Poison Oak. *Quercus* just calls himself *Quercus*, doesn't give us his other name. Can it be *Toxicarius*?

ANSWERS TO "QUERCUS" ARTICLE ON "NATIVES"

"I think that "Natives" is a good article because it's so annoying. I almost have to agree with it, and yet I want to refute everything he says. It makes me furious that he slights my thimbleberries and chokecherries, which along with the dogwood, plums and hawthorns, I love passionately. (Possibly because I dug them up myself.)

"Well, he mentions sentiment. As for the flowers, I know nothing lovelier than the native iris. It might be interesting to see if anyone else has the reaction I have, and if so, it might serve to make Coloradoans keenly aware of just what their "natives" are. I'm not positive that's not "Quercus' true aim."

—Betula (Birch).

"'Quercus'—The best page in the GREEN THUMB, and that's saying a lot, for it is worth every mite of the dollar year membership. That's my short statement in favor of the column—but—being a woman, I must add a bit of criticism in favor of our 'Natives.'

"Did you ever bring agate, moonstone or shells and coral bits home from the seashore? Did you notice how their luster faded when robbed of their background?

"I, too, confess that I have carried wild 'Natives' home from the mountains only to find them lose their glamor in the choicest spot of my garden. Now, have you suddenly come upon a mountaineer's cabin garden with yellow roses blooming, or peonies, or lilac bush in full bloom, or maybe dahlias or gladiolas (I still like gladiolas), and did you notice

how these gorgeous 'city creatures' were eclipsed by the nearby fields of penstemon, bistort, paintbrush in its many hues, mertensia, daisies of every description, coin flowers, fairy trumpet (gilia) fireweed and beeplant, thimbleberry blossoms, or a carpet of alpine pinks, or kinnikinnick and Oregon grape in bloom or berry?

"Do fine feathers always make fine birds?

"Quercus, now I ask you, just why do you hie off to the hills whenever you can—and I know you do? Queer? No. I don't think so.

"Sincerely your enthusiastic reader."
—Rhus (Skunkbrush).

I've a thing or two to say about Quercus, or rather about his September contribution. To criticize a man with a private botanical garden of native plants for not introducing Elmohr iris and the latest in heavy-headed giant dahlias is a little like condemning Socrates and Lincoln for not looking like Apollo or crooning like Bing Crosby. Those were not the things they were trying to do. Plant explorers have introduced many beautiful foreign plants and hybridizers have made more exquisite both foreign and native ones. We who grow for garden pictures and floral arrangements take full advantage of their work. And rightly. But what has that to do with the man who wants to collect our natives? To my thinking, there are all too few gardens of our native plants. Didn't Mr. Andrews have one, valuable to the world as well as to us?

—Del Phinium.

TREE TRIMMING FOR COLORADO

GEORGE W. KELLY

We have received several requests for a short summary of the essential requirements for proper trimming of trees. With the shortage of experienced experts it is important that we know enough about what constitutes a good trim job to be able to supervise inexperienced help, or do the important things ourselves.

In the first place we should consider the reasons for trimming a tree. No cut should be made without a definite reason. Inexperienced people can get a lot of brush out of a tree in a short time, but may do more harm than good.

Trimming is done to:

- Improve or maintain desirable shape, symmetrical or natural, by—
 - Removing too low or too high limbs.
 - Cutting back lopsided trees.
 - Removing limbs which interfere with buildings, wires or other more valuable trees.
- Build up a sturdy framework of limbs, by—
 - Cutting out bad crotches when small.
 - Shortening back too heavy limbs, or
 - Thinning to reduce weight and minimize storm damage.
 - Removing duplicate, weak, rubbing or misplaced limbs.
- Remove dead limbs so that the scar can heal quickly.

In shaping a tree you cannot add a limb to fill a vacancy. All you can do is cut back the limbs that are too long and let the shorter ones catch up.

Often, of more importance than the removal of live limbs is the treatment of former scars, removal of dead stubs and shaping, draining or filling of partly decayed holes. In every operation the thought should be in mind to so shape the wound that the new growth can grow over it as soon as possible. This usually means to so streamline the wound that the sap flowing by can deposit new material and heal it over.

Painting is not as important here as in a rainy country, but for cuts of two inches or more, where there is liable to be decay before it can naturally heal over, it is necessary. An asphalt roof paint is good, as it is flexible.

Bracing is necessary in the case of bad crotches which are liable to break or those partly split by storms. On smaller limbs screweyes connected with clothesline wire

are effective. Larger limbs and trunks of trees require bolts at the split and cables higher in the crotch to remove the strain. This is a technical operation which requires a study of each particular job.

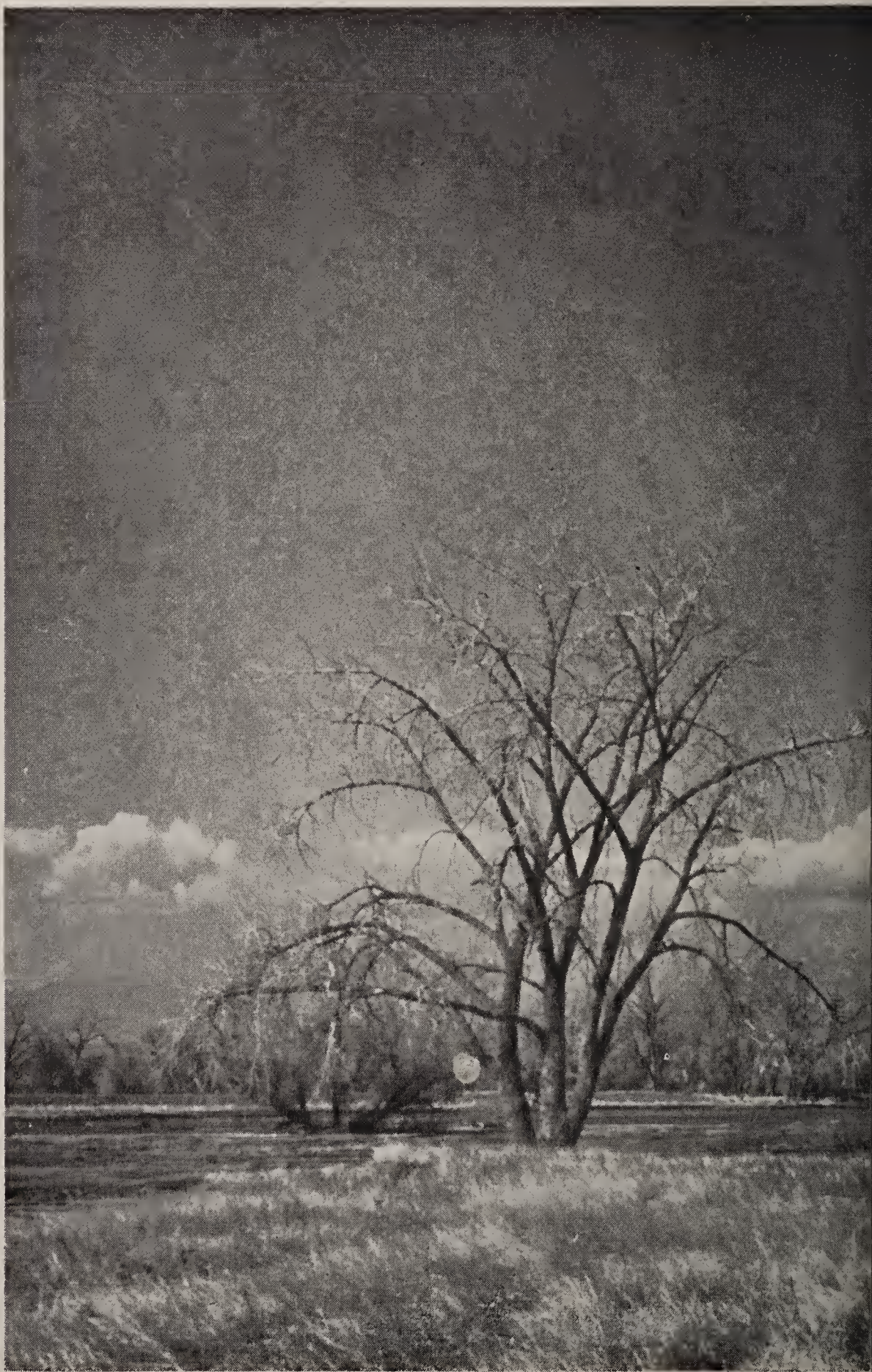
In removing large heavy limbs it is safest to first remove the bulk of the weight of the limb and then make the final cut close up to avoid splitting and peeling down. It will be necessary to lower large limbs carefully with a rope. It is always safest to make an undercut below the main cut of a limb to avoid splitting down and disfiguring the tree.

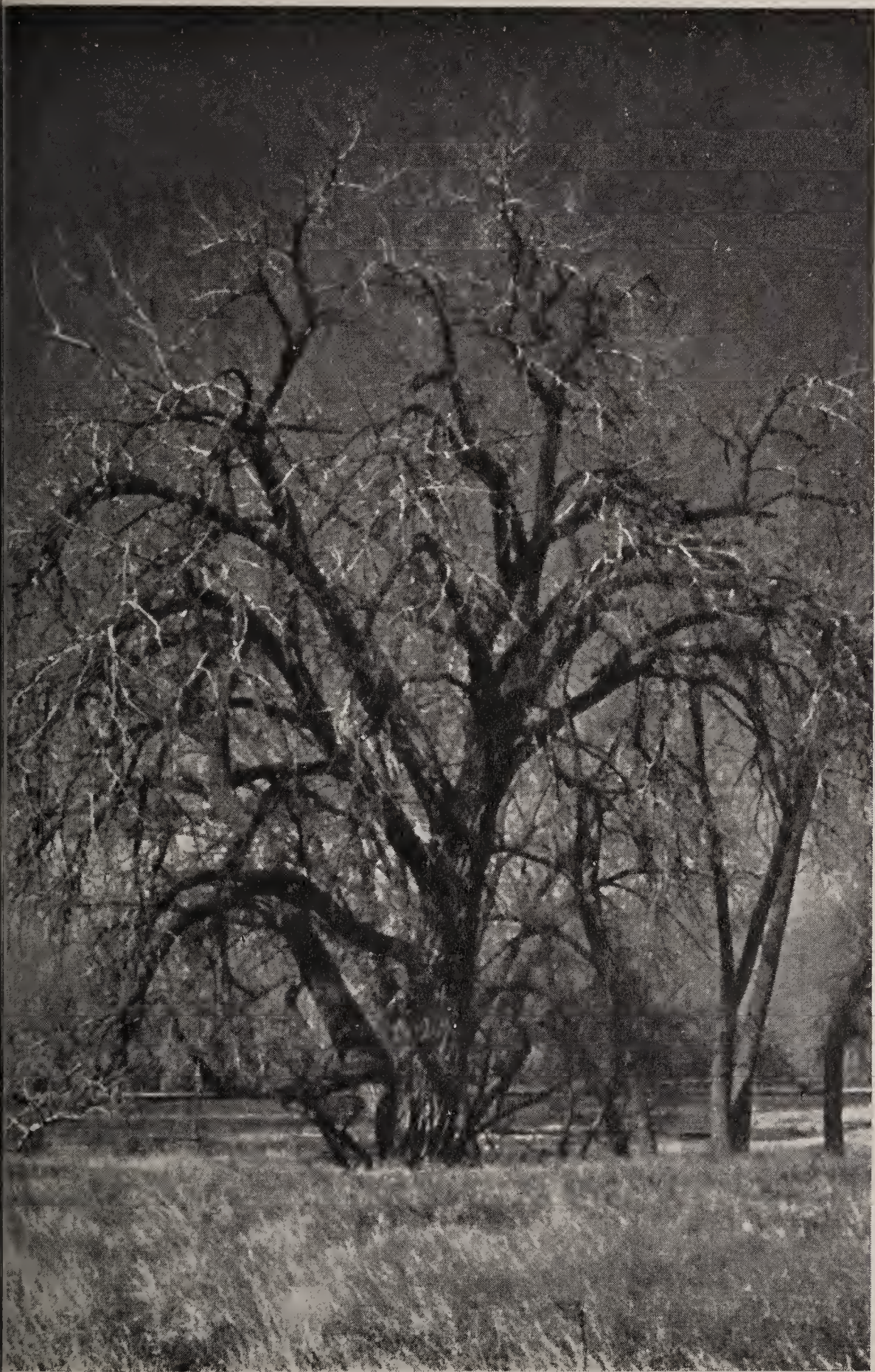
When to prune is sometimes a question. Most trees can be trimmed at any time convenient, but they are easier to work on in the winter when the leaves are off. Wounds will heal over sooner if made just before the new growth starts in spring. Maples, Birch, Walnut and some others should only be trimmed while in leaf, as otherwise there is sometimes excessive bleeding.

Much tree trimming is necessitated by neglect or improper treatment. It is much more important to give trees the right care, especially when small, than spend a lot of time later correcting mistakes. These things should be watched. Get good, healthy, well shaped trees with a liberal amount of roots, kept fresh until planted. Be sure that they are transplanted carefully and promptly. Do not expect vigorous healthy trees unless planted in good soil. If necessary, feed and mulch later. Be sure that the tree planted is a suitable variety for the situation, such as shade, moisture, protection and soil. Do not plant too close together for ultimate proper development. Inspect frequently for disease or insect pests and treat at once before serious damage is done. Water THOROUGHLY rather than frequently.. It is the water that gets down to the growing roots that counts.

Here are some of the signs of a poor trim job: Limb stubs left unnecessarily long; "topping," or removal of upper limbs larger than one inch in diameter without a mighty good reason; "thinning" just to make brush, with no particular reason; leaving dead stubs and decayed spots without cleaning out or draining.

Learn something about the growth of a tree, how the sap flows, where the live cambium layer is, the function of the roots and leaves, and you will understand the why of these trimming rules.





COTTONWOODS—Photo by Irvin J. McCrary

COTTONWOODS

By S. R. DEBOER, Landscape Architect

This is a story of western cottonwoods by one who likes cottonwoods. Let us make an understanding right here. If you hate cottonwoods, if the cotton causes you no end of misery, do not read on; you will only become irritated. You might read the last paragraph where I am going to recommend that all of us, including you, plant cottonwoods, but that we use the male or staminate tree which bears no cotton and which the nurseries have propagated these many years.

One day sketching the beautiful oaks and beeches on a Northern England estate, from which the squire duly removed me, even if not forcibly, it struck me that the trees I was drawing were no larger than my cottonwoods on Iliff Avenue and those around the lake in Washington Park. You have to draw trees to appreciate their beauty. Try a big cottonwood. The stem is the blackest of black. Its grooves are deep and rugged. Even if the tree is a female and cotton bearing one, it is decidedly masculine in character, masculine in the sense of strong.

A tree which has reached its full hundred foot spread like the one at Franklin and Ohio Avenue is more majestic than the oaks in other climates. The buds and the twigs are big and strong; it is not a graceful tree, it is a robust and sturdy tree. A thousand artists, young ones and mature ones, have drawn the cottonwoods on Iliff Avenue, but few look at the puny elms or maples nearby.

The cottonwood to me expresses the native, the native of Colorado's nature. It was here when the Indian was here; many of the trees we now admire saw the Indian in his freedom on the plains. Like the Indian, however, the cottonwood does not like the white man's civilization. The cottonwoods gradually retreat from

his cities. In the smoky and soot-laden air they become diseased and die. Hard packed soil or pavements destroy more cottonwoods than the wilful hand of city beautifiers.

Once I was making a study for a western city and arrived there in the evening. Met at the station by the Mayor, I discovered that there was a council meeting that night, also that the council and he had cut down all the cottonwoods in town. The meeting, rather belated, was called by irate citizens to vent their feelings on the council, and I was to act as advisor for the defense and explain the wonderful work the council had done. Was I on the spot. I still don't know how I got out of it, but at any rate I saved the Mayor's friendship. In spite of my lame efforts in his behalf we continued to work together until his death, dreaming new pictures and new spots in the little town in the dust-swept areas. He came to agree with me on cottonwoods.

I know that to the fellow worrying along with hayfever, it is little compensation that someone else likes the cottonwoods, actually can live under them, admires their beauty and power, their hardiness and lack of disease. Little it interests him that it is the historical tree of the West with at least one hangman tree in each town.

Large trees occasionally must be cut down; it is our idea of progress. I hesitate at every one of them. I think of the ages thru which the tree has lived, the children that played around its great trunk, the mothers who sat there watching them. I think of the serious councils men may have held at its foot, how it has cheered and helped the weary traveler. I think of it until some client says cut it down, and down I cut it, and if it was a historical tree, it rates a head-

line saying, 'Landmark Removed' which is the obituary of all landmarks, and I still have to find a headline saying, "Landmark Preserved."

I set out to give comfort to my hayfever friends. So here it is. Let's compromise on the cottonwood business and plant new ones of the staminate or male kind. If and when

trees have to be removed, per force and per se, well let's make sure that it is not a male one, and let's carefully think about the female ones and ask a medico if the hayfever actually comes from there. Then let's give our children a tree to sit under and plant a male cottonwood. (And "That's that" as the Denver Post likes to say.)

BOOKS FOR CHRISTMAS



Herbs for the Medieval Household, by Margaret B. Freeman. Published by The Metropolitan Museum of Art, New York, \$1.50. For the lover of herbs, or of art, this is a nice selection. A beautiful book at a nominal price.

Ornamental American Shrubs, by William R. Van Dersal. Oxford University Press, 1942, \$4.00. Everyone interested in beautiful landscaping will welcome this volume. Unique end papers show the plant growth regions of the United States. Beautifully illustrated.

Learn the Trees from Leaf Prints, by David S. Marx. The Botanic Publishing Co., Cincinnati, Ohio, \$1.00. Something new—actual leaf prints reproduced for the easy identification of our native trees. Not scientific. Fine for youngsters.

First the Flower, Then the Fruit, by Jannette May Lucas. J. B. Lippincott Co., 1943, \$2.00. Intended for young people, but will be appreciated by anyone who loves beauty of growing plants.

For year round profit and pleasure give a subscription to "The Home Garden." Published by The American Garden Guild, subscription office, 444 Madison Ave., New York 22, N. Y., \$3.00 per year. The country's horticultural experts make up the Editorial Board. Contains much horticultural information of value to gardeners anywhere in the United States.

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A new low-cost plastic, Hydroxylin, has been developed in a government laboratory as a general purpose material made from mill-run sawdust or chips.

* * * * *

The City of Grand Junction has a definite plan for Street Tree Planting. Certain streets are set aside for Elms, others for Honey Locust, Linden, White Ash, Kentucky Coffee Tree. Some are treated on informal, open plans, others are set aside as boulevards with such flowering trees as Crab Apple, Hawthorn, Japanese Varnish Tree and Mountain Ash being featured.

COLONEL EDGAR TARBELL ENSIGN

Father of Colorado Forestry

By W. J. MORRILL

FOREWORD. Just sixty years ago, in November, 1884, the Colorado State Forestry Association was born. Its father was Colonel Edgar T. Ensign who served as State Forest Commissioner from 1885 to 1891. His efforts in behalf of forest protection had a great deal to do with the creation of the U. S. Forest Service. We are pleased to present Professor Morrill's article on Colonel Ensign.

Born in Moriah, New York, in 1839, Colonel Ensign was a resident from 1856 to 1874 of Iowa, from which state he volunteered in 1861 to defend the Union. As a soldier he advanced through various grades to a Colonelcy. He was admitted to the Iowa bar and made District Attorney in Des Moines. In 1872 he married Lilla Butiss.

Attracted by the opportunities in the West, Colonel Ensign moved to Colorado Springs in 1874, opened a law office and soon afterward was Commissioner of the United States Circuit Court. Later, while associated with Paul Hutchinson in the real estate business, he took part in the early development of Colorado Springs and promoted several additions. He was also an organizer and later president of both the Assurance Savings and Loan Association, and the First National Bank of Colorado Springs. He was an active member of the Congregational Church of Colorado Springs.

In the course of time Colonel Ensign showed much concern for the waste and current destruction of Colorado forests through exploitation and fire. In 1884 he wrote a series of articles published in the "Colorado Springs Gazette" on the pressing need of forest conservation. Under his leadership the Colorado State Forestry Association was organized in November 1884.

The organization considered and passed resolutions recommending to the General Assembly the passage of a number of forest protection measures which were enacted into law that same year.

Among these laws was one creating the office of Colorado State Forest Commissioner. Quite logically, Governor Eaton appointed Colonel Ensign to this office. The measure carried no appropriation, yet the Colonel accepted, knowing full well the burden on his time and finances this would involve. As William G. M. Stone, President of the Colorado Forestry Association, commented, "Col. Ensign did not hesitate; he accepted the appointment and went to work as though he received a salary of \$10,000 a year." However, the state provided stationery, printing, postage, etc.

As State Forest Commissioner he organized the County Commissioners, and through them the County Sheriffs and Road Commissioners, for a measure of forest protection. Fire warnings were posted and pen-

alties for allowing camp fires to escape were publicized.

As a forester, I am amazed at the scope, character and excellence of the reports of Colonel Ensign, written from 1885 through 1890 at a time when no forest schools existed in the United States and when little forestry literature existed in this country. He recognized the indirect value of the forests in regulating water runoff, as well as their economic value in attracting tourists and sportsmen. He called attention to the direct value in furnishing material for our local industries.

Colonel Ensign led the early efforts of the State Forestry Association and the General Assembly to transfer the custody of the public domain forests to that of the State. The Federal Government had done very little along such lines. No Forest Reserves had been established and there were no forest rangers. Many believed the State could do a

better job. In one of his biennial reports he tells of a growing public concern over the deterioration of the forests of Colorado.

Failing in the plan for State custody of the forests, the Association next pressed for adequate federal protection of the public domain forests by the federal government. These efforts, aided by support from public-spirited people largely in the East, finally led to the Forest Reserve Policy adopted in 1891 by Congress. Belatedly, the Forest Reserves were manned in 1898.

There is no doubt that the Colorado Forestry Association contributed greatly to that wise policy which has led to the present system of National Forests.

The Association has had a brilliant past and deserves perpetuation not only for what it has accomplished but what we hope it may be able, united with the Horticultural Association, to do for public service in the future.

DO PLANTS GET HUNGRY?

An English book, published by His Majesty's Stationery Office in London, is *The Diagnosis of Mineral Deficiencies in Plants*, by T. Wallace. It is illustrated with a Colour Atlas and Guide, and is significant—for England. It can only be a guide for the Rocky Mountain Region with its own special problems.

The National Fertilizer Association, in conjunction with the American Society of Agronomy, publishes *Hunger Signs in Crops*, an interesting help in the determination of mineral deficiencies.

* * * * *

A NEW, GOOD BOOK ON SHADE TREES

The Oxford University Press publishes "*Maintenance of Shade and Ornamental Trees*," by P. P. Pirone. It is good, up-to-date, and takes the place of Wm. Soltaroff's *Shade Trees in Towns and Cities*, and of Bernard Fernow's *The Care of Trees*—now both out of print. It is a valuable addition to Victor H. Ries—*Pruning and Repair of Trees, Shrubs and Ornamentals*, and to Elbert Peets—*Practical Tree Repair*.

SOIL DEFICIENCIES AND MALNUTRITION

Do you know that the brain stores great quantities of aluminum? I can't tell you why, but who knows, perhaps it is the difference between the aluminum content of the carrot grown in my garden and the carrot grown in, say, Quercus' garden which makes the latter contributor so much smarter. It may be that Mr. A. F. Hoffman's (County Extension Agent of Delta) experiments on the effects of soil deficiencies on human health and behavior will lead to discoveries of such a nature. In which case, my problem would then be to learn how to get a carrot to absorb aluminum in a form in which I can absorb it so I will be as smart as Quercus. Obviously one cannot just feed an old pot to a carrot.

This train of thought comes from reading about Mr. Hoffman's fascinating experiments in Delta County. Being County Extension Agent of the State Agricultural College his chief concern is the soil which produces food consumed by man and beast in his county. He is trying to find out if problems in human nutrition and behavior are related to problems in crop yield and are really problems of the soil.

Most people now believe that land will eventually "wear out" for they have seen enough of erosion, dust bowls, "Tobacco Roads" and such to convince them. They understand that land fertility must be maintained through proper use, saving crop residues, preservation of the elements in barnyard manure and use of fertilizing elements. He writes, "The Western Slope and San Juan Basin of

Colorado were occupied by the Ute Indians until the fall of 1880. The soil is new in the number of years it has been farmed. Favorable climatic conditions and abundance of irrigation water have combined to make this an area of high crop yields. Over 15 years ago Delta County had a '100 Bushel Corn Club.' Now, to the natural precipitation farmers add irrigation water until the total is equivalent to precipitation in humid areas. The application of this much water during the short growing season creates soil fertility problems due to sheet erosion and leaching. These factors combine with heavy crop removal to make the soils of this area grow old quickly. Soil depletion is obvious in varied forms. Yields of alfalfa hay, in spite of the now general practice of applying superphosphate, have been on a downward trend."

He says this depletion causes "Anemic conditions in hogs due to copper deficiency, leg weaknesses in poultry due to manganese deficiency, and loss of type and bone in livestock generally."

Mr. Hoffman believes that the most important part of soil depletion may be its effect upon human health and behavior, for "food is the result of soil," but he is not one to be content with mere conjecture.

"Because the application of good principles of farming has not produced results in Delta County, an attempt has been made during the past four years to arrive at basic causes for such failures." In the hundreds of soil and fertilizer tests con-

ducted it was proved that boron, manganese, sulphur, phosphorus and potassium were often lacking. "Over 1,900 soil samples have been gathered and analyzed this year. Three hundred field demonstrations have been started and several hundred more will soon be started. The deficiencies are then charted on a county map."

Authentic information from the science of human nutrition tells us such tidbits as: blood will not coagulate without calcium, phosphorus is needed for cell growth, potassium and sodium permit muscular flexibility. Cranberries contain that essential iodine which is lacking in Northern Colorado soils, watermelons contain bromine, the element which enables you to punch a man in the face. Manganese has something to do with the maternal instinct, silicon helps maintain hair, skin and nails, but don't go out and eat sand for some of these essential minerals

do much harm when taken in too great quantities. Fluorine is good for the teeth up to a certain amount, but if you get too much you may get speckled teeth. Iron is an essential part of every living cell, but copper must be present to make it effective. Cobalt helps build red corpuscles, arsenic is in your hair. And so it goes with all the elements and also vitamins, and who knows what other mysteries still hidden in the soil and foods that come from it.

Mr. Hoffman has prepared an amazingly complete outline of constructive action to be taken by this county which has become so soil and health conscious. If other counties wish to use it as a model they may write him for his proposed community project. This is a tremendous field, and we feel that Mr. Hoffman is to be heartily congratulated on his extensive study.

—Frances W. Hadley.

BLUE FLOWERS FOR COLORADO

By MAUD F. McCORMICK

It is not easy to sit quietly listening while someone gravely speaks of the difficulties of growing flowers in Colorado, of the few plants which will endure our sudden temperature changes, our drying air, and our ever uncertain winter weather. For, whatever the problems occasioned by our winter weather (and many plants are lost by heaving) these problems seem easier to solve than those of the long, hot summers of the Middle West, at least so far as their effect upon the herbaceous perennials is concerned. Colorado has its share of plant pests and diseases, but in

the Middle West they have longer and more prolific lives. Besides, were it not for the more humid air and greater soil moisture, the Middle West would show more disastrous paucity of bloom in its long, exhausting dog days. Our season here is far shorter, but not our wealth of bloom or variety of perennial plants.

"We use a good many hemerocallis, since they are heat-tolerant," wrote a St. Louis correspondent recently. "But we cannot combine them with delphiniums with any great success since they are far too unhappy in our hot summers. Platycodons are

the only tall blue flower we can depend upon here." That statement calls attention to the great wealth of blue flowers to be found in Colorado. A trip into the mountains at almost any time during the growing season reveals that here is the natural home of flowers that reflect the sky. Harebells, lupine, larkspur, vervain, gentian, sage—there is hardly a time when wildflowers are not blue on our plains and hillslopes way up to the Alpine forgetmenot.

The wealth of blue perennials from which to select garden favorites is equally great. From early squills, violas and anchusas to the August-blooming platycodons and scabiosa fischeri and the even later blue sages Mr. Andrews made known to the gardening fraternity, our perennial borders need not lack the lovely color. The campanulas, easy of culture and generous of bloom, provide both low-growing and tall border blues; the "fairy flax" gives us misty blue in the spring while the delphinium can be the garden's queen in late June and July and again from September until frost.

Few people realize the infinite possibilities here in Colorado for garden use of delphiniums. Encouraged by plenty of open air and sunshine, plants of certain strains show a tendency to bloom themselves to death, especially if they are kept well-fed and watered and not allowed to produce seed. By growing his own seedlings in a row in the vegetable garden and selecting the choicest for places in the border, the gardener may have all he wants for a minimum outlay and need not be too unhappy if the plants do not live overlong. Since the hybridizers are experimenting and improving the plant from year to year, it is always most interesting to see what the latest crop of seed will bring forth. There will be weaklings, but a majority of the plants will be sturdy and floriferous, and there will always be some of breath-taking beauty.

The owner of such a plant may perpetuate its loveliness by cuttings or divisions in the spring, preferably of its third year. Or he may extend the plant's life-span by letting it rest between blooming periods and reducing the number of spikes of fall bloom. The older the plant, the more susceptible it is to depredations by insects, for which reason the cut-flower growers replant frequently and, like all good farmers, practice crop rotation. As control of pests is not difficult, the home gardener may let his plants live out the natural cycle of their lives.

Colorado soil suits delphiniums and wants NO LIME to keep them happy. Sifted coal ashes over the crowns in the winter do no harm and may be of some value. Planting too deeply may be an encouragement to the dreaded crown-rot. At any rate, it is safe to plant the seedlings or mature plants at the depth at which they have been growing. It is also a good idea, though not necessary, to follow the planting instructions of an eastern delphinarian. He suggests the digging of a hole as wide and as deep as if for a peony, the placing of an inverted sod over a generous portion of well-rotted manure in the bottom of it, and then the addition of the topsoil and the setting of the small plant. That procedure should produce exhibition bloom over a long period.

Too much emphasis has probably been placed on delphinium disease. A plant tucked away in the northwest angle of a building, surrounded by other tall-growing perennials, over-fertilized and over-watered, will give a very poor account of itself, if it does not die outright. It needs light and air as much as does a peony or a rose. Robbed of those two requirements, it cannot be expected to grow tall and blue. Use columbine, blue phlox, or other shade-lovers in such a location and still have plenty of Colorado's lovely blue.

FALL GARDEN NOTES

There are usually several weeks in winter when garden construction can conveniently be done. Build pools, platforms, fireplaces, walls and walks now when other garden work is not pressing. Unless it is liable to be very cold in the night cement work can be protected with a covering of burlap, straw, manure or blankets.

There should be some "bad" days now when there is nothing that you can do out of doors and you can feel free to sit and read about some of the many interesting things connected with gardening. Now is a chance to learn more about garden insects, and fertilizers and new plant introductions and all those fortyseven things you have been too busy all summer to learn about.

If there are improvements needed in your garden (and whose garden does not need improvements) now is your opportunity to plan those things that you will need. Better put it on paper or you will forget. One of the trials (and joys) of a garden is that it never "stays put." The best planned garden will look wrong in a few years if there is not a continual revising and renewing, and trimming, and dividing of plants. A garden left alone will soon be dominated by all the hardy rank growing things, and the nice tender plants crowded out.

How about extending the joys of growing things into the winter by planting evergreen window boxes. Small spruce, fir, juniper, pine, myrtle, English ivy and euonymus are suitable for this. Liven them up with stems of bright berries from shrubs and trees. These can be renewed occasionally.

Every home (or office) should have some sunny window where a few hardy plants can be grown during the winter. If your conditions are not favorable try only those plants which have proven that they can take it. Any florist should be able to advise you.

Because the leaves and flowers are all gone is no reason to think that there is no beauty left in growing things. Now is when we should enjoy the evergreens, the bright berries which still persist, the plants with bright colored stems and the varied forms of the bare trees and shrubs. Learn to know the different trees from their bare outlines against the sky. It is an interesting game.

When the cold weather comes and the snows cover everything, remember the birds. Have cornstalk shelters erected for the ground feeders, and shelters and feeding stations in the trees for other birds. The birds will soon find it out if suitable food is regularly available.

Horticulturists should not have to worry long over their Christmas lists for other gardeners. Bulbs, seeds, tools and books offer unlimited possibilities. And most any good nurseryman will arrange for you to give a Christmas order for those plants which must be moved in spring. Garden magazines are always welcome. (How about sending the GREEN THUMB to several of your plant-loving friends?)

Whenever you have a suitable tree, it is a fine thing to decorate a living tree for Christmas. Many plant a spruce or fir in a suitable location for that purpose. A well decorated outdoor Christmas tree gives pleasure to many people going by and helps to prevent the overcutting of forest trees for temporary indoor use.

If possible shorten back the rank growth on Chinese elms to prevent storm damage. When the first wet snows come check up on all the evergreens and tall slim shrubs that they are not weighted down to the ground and broken. Shake them gently so that you do not do more damage than the snow. Avoid piling snow on low evergreens. When limbs are broken, cut them off close up to the stem if they are too bad, and if there is a chance to save them tie them up until you can get an expert to care for them. (Try to get one these days.)

FALL GARDEN NOTES



If you intend to plant any tulips, narcissus, lilies or other fall bulbs, do so at once, as the sooner they are in the ground the better. In Colorado plant them a little deeper than eastern growers recommend. A bed spaded deeply helps.

During the warm days which we usually have in November and December it is a good time to clean up the garden; dispose of limbs and stems too coarse to make compost, rake up leaves and plant tops which are suitable for the compost heap, and spade up the annual beds. Spade under some good manure or compost. Fall spaded soil will be in better condition for early spring planting.

Winter protection usually consists in mulching the roots of perennials, bulbs and such to prevent too sudden changes in soil temperature; and protecting above ground stems from the excessive drying out of our warm sunny winter days. Mulching may be of peat, compost, manure, hay, straw or leaves. It is better not to put it on too heavy at first. The leaves which the fall winds blow around naturally will usually be sufficient until after the ground is frozen. Then more may be added, being careful to avoid matting down. Some brush under the leaves will prevent their smothering the plants under them, and some brush or evergreen boughs over them will keep most of them in place. Prevent the excessive drying out of tender stems such as climbing roses, young linden and mountain ash trees and half hardy shrubs, by partially shading them. Evergreen boughs are about the right kind of protection, but wrapping with burlap is sometimes valuable.

Tender tea roses require a special kind of winter protection. The best treatment is to mound a bushel or so of good soil from the annual bed around each plant late in fall after they are thoroughly dormant. Pulling the necessary soil from between the plants is liable to expose the roots too much. When winter really sets in let the leaves fill in the spaces between the mounds of soil or throw in some straw or compost. By spring the plants will have usually died down to the soil level so cut them back now or in spring as is most convenient.

Water sparingly in fall when the plants are ripening up, then when they are entirely dormant and before the ground freezes solid BE SURE that the ground is THOROUGHLY soaked. This will help to prevent "fall kill" which is usually a large proportion of the damage charged to "winter kill."

If necessary to mow lawns any more, raise the mower to leave the grass as long as possible, and let the clippings fall whenever possible. This will help to mulch the lawn, tending to keep in the moisture and preventing too sudden changes in soil temperature during our erratic winters. Lawns may need water several times during the winter if there are several weeks without much rain or snow.

Any time, in fall or spring, after the plants are dormant (have shed their leaves) until they start to leaf again; and the temperature is well above freezing; and there is not too much wind; is the time to spray for scale insects. A miscible oil or lime sulphur is usually used, and must be in the right solution. If too rich it may burn or kill plants and if too weak will not kill the scale. Look especially for oyster shell scale on lilacs, dogwood, cotoneaster, ash and cottonwood; pine scale on pine and spruce; and especially elm scale on all elm.

The Green Thumb

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LILAC MONT BLANC

BLOOMING AT THE FOOT OF PIKES PEAK

Photo by K. N. Marriage, Colorado Springs

LILACS for COLORADO

By MILTON J. KEEGAN

"The lilac is popular throughout the world, but I believe that nowhere is it as beautiful as in the United States and Canada. In those countries the contrast between the dry warm summers and the very rigorous winters lends itself wonderfully to the development of the lilac and the richness of its bloom." (1) This statement, applicable to much of Colorado, was made by Emile Lemoine of Nancy, France, who with his father Victor Lemoine, (2) originated a very large percentage of the most beautiful modern varieties of the "old-fashioned" common lilac. The terms "French lilacs" and "French hybrids" have, as a consequence, been loosely applied to the large group of improved modern varieties of the common lilac (*Syringa vulgaris*) in commerce today. (3)



LILACS, PRESIDENT GREVY, BELLE DE NANCY AND TOUSSAINT L'OUVERTURE

It was three-quarters of a century ago that the German army overran Nancy, France, in the Franco-Prussian War. Within that city was a garden where Victor Lemoine, then nearing fifty, and his wife had been working for twenty years. They picked up the

pieces and went right on working until the enemy began their homeward journey back towards the Rhine. When the siege lifted the first of the French

(1) Alice Harding, "Lilacs in My Garden." Macmillan, 1933.

(2) "Pierre Louis Victor Lemoine, the greatest hybridizer the world has known. He came by his talents naturally. He was descended from a long line of gardeners and nurserymen. Born at Delme in Lorraine, October 21, 1823; he went through school and college and then devoted several years traveling and working in the leading horticultural establishments of Europe In 1850 . . . he settled down at Nancy both as a florist-gardener and as a married man. . . . As early as 1885 France honored him with its Legion of Honor and in 1894 advanced him to the grade of officer. . . . He died in his 89th year, Scarcely a garden in this new world or the old but bears some flowering monument to him. . . ." Richardson Wright, "Men Who Make Our Flowers—Victor Lemoine," House & Garden, April, 1937, p. 66; see also T. A. Havemeyer's "How the Modern Lilac Came to Be: Recounting the story of Mr. Lemoine's work," Garden Magazine, May, 1917, 25:232.

(3) "Introduced into cultivation before 1560, the old-fashioned lavender-colored lilac (*Syringa vulgaris*) and its white-flowered form have been grown so long in cultivation that many variations have arisen. From this early date, the hundreds of pink, red and deep purple.

lilacs were ready to be introduced to the world's gardens. One of the most beautiful double lilacs to come from their garden was named after the French lawyer, Leon Gambetta, who led the patriotic but untrained French army that tried so gallantly to defend that part of France. One of the finest single lilacs, Capitaine Baltet, was named for the son of his friend Charles Baltet, nurseryman of Troyes, who gave his life defending France in World War I, and another which some critics say is the handsomest of all single lilacs is named Marechal Foch. Victor Lemoine lived into his 89th year—and near the end, as his eyesight began to

fail, it is said that his aged wife climbed the garden ladder to pollinize by hand the lilacs they never ceased to improve. Their son Emile Lemoine has carried on to excel the varieties that the experts thought were impossible of further improvement.

"Lilac," writes C. P. Halligan (4) of Michigan State College of Agriculture, "is the quaint name of this quaint shrub from that ancient center of civilization, Eastern Europe, where this beautiful word of Persian origin means flower. . . ."

"Comely and vigorous in its youth, stately and elegant in its prime, perma-

flowered forms have gradually arisen and been carefully selected and propagated. . . . The term 'French hybrids' has been loosely applied to the large group of varieties of the common lilac, probably because so many of them originated in France. Victor Lemoine and his associates have been more outstanding in introducing varieties of the common lilac than any others. However, a great many horticulturists have worked with the lilac, carefully selecting plants in France, Germany, Belgium and Holland. Comparatively recently some of them have originated in the United States and Canada" Donald Wyman, "Just About Lilacs," Arnold Arboretum, Harvard University Bulletin of Popular Information, May 20, 1936, 4:39-40.

It is obvious that the "old-fashioned" common lilac we remember in the gardens of our parents and grandparents were improved varieties that were a far cry from the wild *Syringa vulgaris* plants that grew in the mountains of Europe five centuries ago and which can still be found growing in the mountains of Bulgaria. The old-fashioned common lilacs still in commerce today probably are improved varieties brought to America from Europe by early settlers of a century or two ago.

As to the untamed and unimproved wild species *Syringa vulgaris*, Ernest H. Wilson in "Aristocrats of the Garden" 1:214 says: "In the Arnold Arboretum may be seen growing specimens raised from seeds gathered from wild plants. They have narrow clusters of dull purplish flowers and are by no means attractive garden shrubs."

For a reader who may be curious about how "Syringa" became the generic name for Lilacs and why it is still sometimes erroneously applied to mock-oranges: "Syringa, modern Latin from Greek syrinx, a pipe. First applied about 1664 as a common name to the mock-orange because its branches were used for pipe stems (the pith is easily removed). Later used as a generic name for the Lilac. The mock-orange was named by Linnaeus Philadelphus Coronarius—the genius—for no obvious reason, while the specific name is a Latin word meaning belonging to a wreath or garland. This present usage of the genera names Syringa and Philadelphus is due to Linnaeus who included them in his 'Species Plantarum,' 1753 15.", Hervey W. Shimer (Prof. Emerit. of Paleontology, Mass. Inst. of Tech.) "Origin and Significance of Plant Names," p. 56, published by South Shore Nature Club, Hingham, Mass., 1943. "Vulgaris," of course, is a Latin word meaning common.

- (4) C. P. Halligan, "Hardy Shrubs for Landscape Planting in Michigan," Mich. St. Coll. Bull. 152, Nov. 1935, verse by Violet Jacobs.



LILAC-TIME

ment and picturesque in its old age, it seems to typify that domestic dignity we associate with those lovely old homes of our ancestors,—an inheritance of today from generations of the past. Then it was universally used, whether it was about the small simple cottage of the peasant or the mansion of the nobleman,—we were assured always of its presence.

“‘And close beside the gateway,
Tall, upon either hand,
Their green robes shot with sunlight
Like queens the lilacs stand.’”

“Now, the common lilac,” says Ernest H. Wilson, (5) former keeper of the Arnold Arboretum at Harvard, who had such a contagious enthusiasm for horticulture, “is a native of the mountains of Bulgaria and was sent from Constantinople to Vienna about 1560. From there it soon reached Western Europe and both purple and white kinds were cultivated in London in 1597 by Gerard. It is not known with certainty when or by whom the lilac was introduced to North America, but Washington (6) wrote about it in his diary and planted it at Mount Vernon where his plants or their

descendants are growing this day.” E. A. Upton reports that “in 1771 William Prince, American Nurseryman, offered blue lilacs at one shilling and white lilacs at two shillings.”

In spite of the fact that the “old-fashioned” lilac (*Syringa vulgaris*) has been cultivated in Europe for five centuries, in America since Colonial times, and in Colorado since the “Pikes Peak or Bust” Gold Rush days of 1859, the greatest improvement in general quality, size, substance and range of color has been made in the present century and more particularly during the last twenty-five years. The Lemoine varieties introduced since 1910 particularly stand out. (7) The best modern varieties have foot-long panicles with large nickel- to dollar-size florets. The new varieties come with single florets up to 1½ inches across and with double flowers like small roses—and they especially recommend themselves by the richness of their coloring which ranges from snow-white to lilac, to mauve, to purple and almost to blue and red.

A famous English gardener once said: “The ideal size garden is one that

(5) Ernest H. Wilson, “Aristocrats of the Garden” 1:213-4. The Stratford Company, Boston, 1926-1932.

(6) It is not known whether any direct descendants of George Washington’s “Lylacks” are growing in Colorado. However Eva Bird Bosworth “Trees and Peaks” (1911) quoted from W. G. M. Stone, the president of the State Forestry Association, “The New Trees for Colorado” in part: “On the Capitol grounds . . . are . . . black walnuts grown from seed personally gathered by Governor Routt from a tree planted by Abraham Lincoln at his home in Springfield, Illinois. The Governor planted the nuts in his yard at the corner of 14th and Welton, and when large enough to transplant they were set by him where they now stand. They are a memorial of the immortal Lincoln and the first Governor of the State of Colorado.”

(7) “Lilacs for America” a Report of 1941 Survey conducted by the Committee on Horticultural Varieties of the American Association of Botanical Gardens and Arboretums, published by The Arthur Hoyt Scott Horticultural Foundation, Swarthmore Collège, Swarthmore, Pa. 1942 Revised and Corrected 1943, price \$1.00 per copy.

is not quite big enough." Most gardeners can afford to plant only the very finest garden aristocrats.

It was Ernest H. Wilson who said: "With boundless wealth in plant material at our command we may enjoy quality . . . , and the best costs no more to grow than that of inferior merit. Granted it is more difficult to obtain but there is sport in hunting down and securing trophies. There is indeed real fun in this and the pleasure does not end there. . . . The size of a garden rules quantity but not quality. If in the garden there be room for one plant only then I would have this plant, the most beautiful that can flourish there," (8)

For the gardener who has room for only a few lilacs and the nurseryman who wishes to stock a limited number of varieties that will sell, the seven hundred named lilac varieties and species are bewildering. The Arnold Arboretum lilac collection contains nearly 500 varieties and species. The Highland Park, Rochester, New York, and the Morton Arboretum, Lisle, Illinois, collections have about 400 each.

In the past two decades many experts have tried to guide the amateur through this trackless lilac forest by compiling lists of the best dozen or

two. (9) Three books on lilacs have recently been published. (10)

In 1942 the results of the excellent and authoritative national survey (under the chairmanship of John C. Wister) of all the 700 lilac varieties and species was published in "Lilacs for America." (7) The consensus of opinion of nurserymen and collectors throughout America on general garden value of the variety and species was shown by using the numerical system: 9-10 best; 7-8 very good; 4-6 good; 0-3 poor.

The Colorado survey (11) has followed the method of numerical rating used in the national survey. Colorado nurserymen and collectors were sent a list of the 100 varieties and species tentatively recommended in "Lilacs for America" (7) and were asked to rate them and also any others they had had experience with.

Colorado plant zones vary from the Plains Zone (3500 to 6000 feet), the Foothill Zone (6000 to 8000 feet), the Montane Zone (8000 to 10,000 feet), the Subalpine Zone (10,000 to timberline), and the Alpine Zone above timberline and up to 14,431 feet. With all these varied climates and lengths of growing season in Colorado a person who tries to summarize a Colorado survey might get alarmed by an emi-

(8) Ernest H. Wilson, Idem. Prologue XIII-XVIII.

(9) Richardson Wright, "Lilac Rex," House & Garden, May 1937, Sec. 1, p. 47; John C. Wister, "Four Seasons in the Garden" (1936) p. 118; same author "The Lilac Line-up for Gardens Great and Small," House & Garden, Mar. 1934, 65:26; Leonard Barron, "Mr. Havemeyer's Lilacs," Country Life, May, 1934, 66:66; Ernest H. Wilson, "Lilacs Wild and Otherwise," House & Garden, May, 1929, 55:116; same author "Garden Aristocrats" (1926), Ch. "In 'Lilacdom'" 1:213; Alice Harding "Lilacs in My Garden" (1933); Montague Free, "Gardening," p. 104 (1937).

(10) Alice Harding, "Lilacs in My Garden," Macmillan, 1933. John C. Wister, "Lilac Culture," Orange-Judd, 1930, 1936. Susan Delano McKelvey, "The Lilac," Macmillan, 1928.



*"With many a pointed blossom rising delicate,
with the perfume strong I love."—Walt Whitman*

nent Irishman's warning: "All generalizations are false—including this one."

However one very interesting result of the survey is that nearly all lilacs and especially the French varieties seem to grow well in Colorado almost all the way up to timberline.

In mile-and-a-half-high Gunnison, Mr. Henry F. Lake, Jr. is successfully growing 77 lilac varieties in his 7700-

foot-high garden. He says in severe winters there the temperature drops to 47° below with three feet of snow. He writes: "We have in Western Colorado, a march of lilacs lasting a month, from the time the early ones come out at Grand Junction (4,583 ft.) progressively through Delta (4,980 ft.), Montrose (5,820 ft.), Hotchkiss (5,370 ft.), Paonia (5,696 ft.) Ridgeway (6,990 ft.) and lastly our blossoms in the moun-

(11) George W. Kelly has included a lilac survey in his excellent series of surveys of garden aristocrats that thrive in Colorado climate. He sent ballots to about seventy-five nurserymen and gardeners in Colorado. Kelly assigned to the writer the interesting task of summarizing the results for "The Green Thumb." Thirteen ballots were returned with valuable notes from points all over the state as compared to 38 voters in the national survey. We are only sorry that limitation of space prevents quoting all of the interesting comments. Three voted on 50 to 60 varieties, one on 40 varieties. The average number voted on was eighteen. Several voters are growing the newer varieties and latest novelties but haven't accumulated enough experience to vote on their merits.

tain towns of Salida (7,050 ft.), Ouray (7,721 ft.), and Gunnison (7,683 ft.). Our season (Gunnison) is a week to ten days later than Salida. . . . As a newspaper editor (Gunnison News—Champion) I have a good many contacts with people living at still higher altitudes in Crested Butte (8,867 ft.), Lake City (8,681 ft.), Pitkin (9,200 ft.) etc. Have been giving them specimens of peonies and lilacs to try, and so far as I can see their culture can go up to timberline.” (12)

Lemoine J. Bechtold reports that at his summer home in Bear Creek Canon near Evergreen at 7,000 feet altitude in subirrigated location near that mountain stream the French lilacs and the species and hybrids *persica*, *chinensis*, *josikaea* and *Henri Lutece* all do beautifully. Luther White, pioneer nurseryman in the White River country at Meeker, writes that “all lilacs are hardy and beautiful here.”

In mile-high Denver the peak of bloom (*Syringa vulgaris* and its modern French varieties) extends over about a two-weeks' period in May but fluctuates with our spring weather from early May to mid-May or even late May as happened last spring (1944). Mrs. G.

R. Marriage's Upton Gardens collection at Colorado Springs (5,900 feet) was exceptionally beautiful last spring, blooming somewhat later than in Denver. She says the French lilacs bloom late, so are rarely hurt by frosts. D. M. Andrews told the writer that his Rockmont Nursery collection of a hundred varieties of imported French lilacs at Boulder (5,350 feet) bloomed heavily on an average of three years out of every four. Andrews said fall transplanting was probably even better than early spring.

In the following tabulation of the results of the Colorado survey the Lemoines of Nancy, France, in the year designated, introduced the varieties of the common lilac listed except where otherwise indicated.

The color classification in “Lilacs for America” is followed in the tabulation. Lilac colors are combinations of blue and red of numerous hues, values, intensities and purity. The colors vary from buds to open florets and from day to day until they fade. The color of a given variety of the common lilac is almost as difficult to describe accurately as is the familiar and delightful lilac fragrance common to *Syringa vul-*

- (12) Among the French lilacs Lake mentions as outstanding at 7700 feet elevation are in alphabetical order Capitaine Baltet, Edith Cavell, Ellen Willmott, Henri Martin, Ludwig Spaeth, Mme. F. Morel, President Fallieres, President Poincare, Reaumur, Vestale, Victor Lemoine, William Robinson, and the hybrids *Chinensis* (except *Chinensis alba*) and the species *persica*. He has a seventeen-year-old *amurensis japonica* tree in his lawn and recommends it as good but thinks the Japanese tree lilac is almost at the limit of climate there.
- (13) “A basic formula for a synthetic lilac oil would consist of approximately fifty parts of Terpeneol, twenty-five parts of Hydroxy Citronellol, six parts of Anis Aldehyde, five parts of Heliotropine, one part of Iso Eugenol, two parts of Alpha Amyl Cinnamic Aldehyde, twelve parts of DiMethyl Benzyl Carbinol, two parts of Phenyl Acetaldehyde, two parts of Anis Alcohol. Besides these, compound oils of Jasmine, Tuberose, Jonquil, Rose, Iris, Orange-blossoms, Ylang, Hyacinth, and others, are added in small quantities.” Dr. Ernst Ohlsson quoted by Alfred Gunderson “Lilacs in the Brooklyn Botanical Garden,” Brooklyn Botanical Record 30:194, July, 1941.

garis and its varieties which is described chemically (13) as the combination of numerous volatile oils under the forbidding name "*three-methyl-valeraldehyde-isopropyl carbinol*, with small amounts of *phenyl acetaldehyde*, *phenyl propylaldehyde*, and *phenyl glycol*." This may explain why a true lilac perfume is not yet in commerce. If any-

one wants to make some the recipe is given in footnote (13).

The numerical ratings mean 9-10 best, 7-8 very good, 4-6 good, 0-3 poor, and for comparison with the Colorado balloting the ratings in the national survey from "Lilacs for America" are also shown.

Common Lilac Varieties

Colo. Nat'l
Aver- Aver-
Votes age age

SINGLE

		8.7	MONUMENT (1934)
4	8.1	8.5	VESTALE (1910)
5	8.5	7.7	MONT BLANC (1915)
		7.7	MARIE FINON (1923)
		7.6	CANDEUR (1931)
3	6	7.5	JAN VAN TOL (van Tol 1916)
1	7.5	7.2	WHITE SWAN (Hav.)
		7.2	MME. FELIX (Felix 1924)
2	6	6.8	MME. FLORENT STEPMAN (Step. 1908)
8	5.2	5.6	MARIE LEGRAYE (1879)

Colo. Nat'l
Aver- Aver-
Votes age age

DOUBLE

I. WHITE

5	8.7	9.2	EDITH CAVELL (1916)
8	8.1	8.0	ELLEN WILLMOTT (1903)
4	5.5	7.1	JEANNE D'ARC (1902)
7	6.4	6.6	MME. LEMOINE (1890)
4	5.5	6.3	MME. CASIMIR PERIER (1894)
1	4	5.5	SIEBOLD (1906)

II. VIOLET

1	5	7.6	DE MIRIBEL (1903)
3	7.3	6.7	CAVOUR (1910)
3	7.3	7.8	MARECHAL LANNES (1910)
2	6	7.2	VIOLETTA (1916)
1	5	6.7	LE NOTRE (1922)

III. BLUISH

(a) Blue

2	8.3	8.7	FIRMAMENT (1932)
1	8	8.5	AMBASSADEUR (1930)
3	7	7.8	PRES. LINCOLN (Dunbar 1925)
1	5	7.0	DECAISNE (1910)
		6.8	DIPLOMATE (1930)
4	7.3	6.4	BLEUATRE (Baltet 1897)
		8.1	AMI SCHOTT (1933)
3	7.3	7.9	OLIVIER DE SERRES (1909)
1	5	7.6	EMILE GENTIL (1915)

(b) Bluish Lilac

		7.9	MAURICE BARRES (1917)
4	7.6	6.7	BOULE AZUREE (1919)
		6.6	GENERAL SHERMAN (Dun. 1917)
4	7.4	7.0	DUK DE MASSA (1905)
7	5.6	6.9	PRES. GREVY (1886)
4	7.9	6.8	PRES. VIGER (1900)
2	6.5	6.7	JULES SIMON (1908)
3	7.7	6.6	RENE JARRY-DESLOGES (1905)

Colo. Nat'l
Aver- Aver-
Votes age age

Colo. Nat'l
Aver- Aver-
Votes age age

SINGLE

DOUBLE

IV. LILAC

(a) Common Lilac Color

		7.9	MARENGO (1923)	2	6.9	7.4	HENRI MARTIN (1912)
2	7.5	7.3	JACQUES CALLOT (1876)	7	9	7.3	LEON GAMBETTA (1907)
		6.7	CHRISTOPHE COLOMB (1905)	2	6.8	6.4	HIPPOLYTE MARINGER (1909)
4	5.8	5.9	HUGO KOSTER (van Tol 1916)				
7	5.3	5.0	VULGARIS COERULEA (Circa 1600)				

(b) Light Lilac

1	4	7.4	WM. C. BARRY (Dun. 1928)	4	7.9	7.7	PRES. FALLIERES (1911)
				5	7.4	7.4	VICTOR LEMOINE (1906)
						7.4	ROSACE (1932)
				1	7	6.9	THUNBERG (1913)

V. PINKISH

(a) Lilac Pink

4	6.8	7.3	KATHARINE HAVEMEYER (1922)
		7.2	CAPITAINE PERRAULT (1925)
3	4.7	6.7	WALDECK-ROUSSEAU (1904)
2	6.5	6.3	JEAN MACE (1915)
3	6	6.2	BELLE DE NANCY (1891)
1	5	6.6	JULES FERRY (1907)

(b) Pink

6	7.4	8.0	LUCIE BALTET (Baltet 1888)	3	8.2	7.6	MME. ANTOINE BUCHNER (1905)
4	8.6	7.8	MACROSTACHYA (1844)				
		6.4	FRAU WM. PFITZER (Pfitzer 1910)	4	7	6.9	MONTAIGNE (1907)
						5.6	VIRGINITE (1888)

VI. REDDISH PURPLE

2	9.5	9.0	GLORY (Hav.)	5	7.9	8.0	PAUL THIRION (1915)
1	8	8.3	MARECHAL FOCH (1924)			7.8	PAUL DESCHANEL (1924)
6	8.1	8.2	MME. F. MOREL (Morel 1892)	3	8	7.0	MRS. EDWARD HARDING (1923)
6	8.3	8.0	CAPITAINE BALTET (1919)				
5	9.1	7.9	MASSENA (1923)	10	6.9	6.8	CHARLES JOLY (1896)
5	8.2	7.9	REAUMUR (1904)	4	7.4	6.8	PRES. POINCARÉ (1913)
7	8	7.4	CONGO (1896)	2	6.8	6.4	GEORGES BELLAIR (1900)
6	6.7	7.4	RUHM VON HORSTENSTEIN (Wilke 1921)	2	6	6.4	PRES. LOUBET (1901)
2	6.8	7.1	MARCEAU (1913)				

Colo. Votes	Aver- age	Nat'l Aver- age		Colo. Votes	Colo. Aver- age	Nat'l Aver- age	
SINGLE				DOUBLE			
VII. PURPLE							
2	9.5	8.4	NIGHT (Hav.)	6.2	ADELAIDE DUNBAR		
3	8.5	8.3	MONGE (1913)		(Dun. 1924)		
1	7	8.1	PRODIGE (1928)	6.2	PAUL HARIOT (1902)		
2	8	8.0	MRS. W. E. MARSHALL (Hav. 1924)				
12	7.9	7.8	LUDWIG SPAETH (Spaeth 1883)				
1	8	7.4	ETNA (1927)				
3	7.7	7.1	DIDEROT (1915)				
		7.1	LA PLACE (1913)				
2	6.5	6.7	TOUSSAINT L'OUVERTURE (1908)				
3	7.7	6.7	VOLCAN (1899)				

Monsieur Lemoine couldn't vote in either the Colorado or the American national lilac surveys. In 1933 according to Mrs. Edward Harding (1) two of Lemoine's favorites were Capitaine Baltet (1919) and Boule Azuree (1919). Several years ago Lemoine's choices were reported (14) by J. Brisben Walker, Jr. to be:

SINGLES		Nat'l Aver- age	Colo. Aver- age
VESTALE (1910)	White	8.5	8.1
MARCEAU (1913)	Reddish	7.1	6.8
MONT BLANC (1915)	White	7.7	8.5
CAPITAINE BALTET (1919)	Reddish-purple	8.0	8.3
MASSENA (1923)	Reddish-purple	7.9	9.1
MARECHAL FOCH (1924)	Reddish-purple	8.3	8
PRODIGE (1928)	Purple	8.1	7
AMBASSADEUR (1930)	Blue	8.5	8
DOUBLES			
MME. LEMOINE (1890)	White	6.6	6.4
ELLEN WILLMOTT (1903)	White	8.0	8.1
MME. ANTOINE BUCHNER (1905)	Pink	7.6	8.2
PRES. POINCARÉ (1913)	Reddish-purple	6.8	7.4
PAUL THIRION (1915)	Reddish-purple	8.0	7.9
EDITH CAVELL (1916)	White	9.2	8.7
KATHARINE HAVEMEYER (1922)	Lilac-pink	7.3	6.8
MRS. EDWARD HARDING (1923)	Reddish-purple	7.0	8
GENERAL PERSHING (1924)	Lilac-pink	6.5	

(14) "Lilacs, Ideal for Colorado Climate," Rocky Mountain News, June 2, 1941.



*"Ever returning spring, . . .
Lilac blooming perennial,"—Walt Whitman*

For those who prefer still shorter thumbnail lists, we give you the choices of three Colorado voters who voted on more than fifty varieties. It is regretted that space prevents listing the favorites of all the voters.

Mrs. G. R. Marriage (Upton Gardens, Colorado Springs) selected the following four as best: Lucie Baltet, Massena, Edith Cavell and Mme. F. Morel. Close seconds included Mont Blanc, Ellen Willmott, Cavour, Olivier de Serres, Duc de Massa, President Fallieres, Macrostachya, Ludwig Spaeth, Paul Thirion, Volcan and Jules Simon.

Roy P. Rogers (Rockmont Nursery, Boulder) in sending in his ballot writes: "Vestale and Mont Blanc are the two best single whites. I cannot see much difference. . . . Edith Cavell is the best double white closely followed by Ellen Willmott. Boule Azuree (ball of blue) is wonderful in flower but seems a poor grower. The two best lilacs we have are Massena (a dark red-purple single) and Leon Gambetta (a lavender-lilac double)." Runner-ups on Rogers' ballot included Monge, Capitaine Baltet, Mme. F. Morel, Victor Lemoine, President Viger, Paul Thirion, Reaumur and Marceau.

Lemoine J. Bechtold writes on his ballot: "Monge, Capitaine Baltet, Massena are my choice three." Rated slightly below these on Bechtold's ballot were Vauban, Mont Blanc, Marechal Lannes, Lucie Baltet, Reaumur, Jan van Tol, President Lincoln, Boule Azuree, Duc de Massa, President Viger, Leon Gambetta, Etna, Diderot, Marechal Foch, Ruhm von Horstenstein, Paul Thirion, Mrs. Edward Harding and President Poincare.

Henry F. Lake, Jr.'s list of outstand-

ing varieties in his collection at Gunnison has been given in footnote (12).

The two most sensational lilacs in the writer's garden, Glory and Night, are both seedlings developed in America by T. A. Havemeyer who grew the finest of the French lilacs in his Long Island garden and did much in introducing French lilacs to other American gardens. Glory, a pinkish orchid colored single bloomed this year with florets slightly over 1½ inches across with ½-inch-wide petals. Night is a regular bloomer with foot-long panicles and florets (flat not cupped) measuring nearly 1½ inches across. Night opens a very dark red-purple (darker than Massena) and slowly changes to a rich royal purple. The almost black blossom buds are not fooled into opening in a warm March spell—and late March or early April storms with 10° or lower leave Night's tight blossom buds untouched.

When Mr. Havemeyer and Mr. Alexander Michie in 1936 sent the writer Glory and Night to try out in Colorado, Mr. Michie said Glory was the finest of all Mr. Havemeyer's raising; and that with them "Night is the finest dark lilac there is." In the national survey these two rated at the top. Mr. E. A. Upton (Upton Nursery Co., Detroit) recently wrote us that he is undertaking to propagate Night and Glory on their own roots commercially. They are well worth waiting for.

In the above short lists the nearest to the familiar lilac color are Capitaine Baltet (a single with quarter- to dollar-size florets), Mme. F. Morel, (a mauve-pink single with nickel-size flowers), and Leon Gambetta (double). President Fallieres and Victor Lemoine also are fine doubles similar to Leon Gam-

betta. Massena is a very deep red-purple single with cupped half-dollar-size florets. All men like it—many women like it too, especially mixed with white French lilacs in a bouquet.

One interesting observation of the Colorado survey on the French lilacs is that in the pink group Colorado voters rate the delicately colored, almost apple-blossom-pink, hundred-year-old variety *Macrostachya* ahead of the coral-pink variety Lucie Baltet. *Macrostachya* buds are an attractive soft rose-pink deep enough to contrast with the nearly white florets barely tinted pink. A mature *Macrostachya* bush loaded with blossoms is much admired. This old lilac deserves its high rating up with the finest of the newest novelties.

For those who are looking for a lilac to fit a small space, Reaumur recommends itself for its low-growing and floriferous habits. D. M. Andrews accurately described Reaumur as: buds deep carmine, florets a subdued rosy-mauve, profuse bloomer, brilliant effect and rather dwarf.

The ballots turned up with widest spread of votes on the old-fashioned *Syringa vulgaris* which included a full house with three 3s and a pair of 9s. The voting on Lucie Baltet ranged from 5s up to 9.5. Most varieties ran fairly consistent in ratings.

Many French lilacs have the virtue of not growing as dense and tall as their ancestor, the old-fashioned common. The dark singles grow more slowly. They can all be kept to within five to eight feet by proper pruning, if they are on their own roots.

Lilacs should be purchased on their own roots if so available. Grafted plants sometimes develop lilac roots and frequently in our soil and climate they do not—and if they do not they may die sooner or later. Lilacs, especially those on their own roots, seldom die from transplanting but they resent it and usually bloom off-color and off-size the first year or two. Once their complicated root system gets thoroughly reestablished they will pay dividends with beautiful fragrant blossoms for a hundred years.

Lilac Species and Hybrids

Probably the brightest jewel among the hybrids is the oldest—a cross between *Syringa vulgaris* and *persica*—in commerce under the names *Syringa chinensis*, *rothomagensis* and Rouen lilac. It was first found growing in the botanical garden at Rouen, France, long ago about the time George Washington was recording in his diary his plantings of “Lylacks” in his Mount Vernon garden. The hybrid *chinensis* comes in various colors, some of the selected varieties having been named. Its blooming season is the same as the

French lilacs. Neither this hybrid nor the *persica* have as good lasting qualities as cut flowers as the French varieties of the common.

The early hybrids do not seem to be widely grown in Colorado—there were votes on only two of them.

Species such as *villosa*, *josikaea*, *reflexa*, etc., that bloom a week or two later than the common (*vulgaris*) varieties, are surpassed by modern hybrids between these species and crosses between these species and the common. The late species and late hybrids which

the writer has tried out have so far been somewhat of an anti-climax after the French lilac show.

The species pubescens so highly rated for its fragrance by eastern writers opens its buds so early in Denver that frequently it is ruined or badly damaged by frost. The fragrance of the few inconspicuous blossoms of pubescens that occasionally survive late winter and early spring freezes is very different from that of the common lilac.

Mrs. Marriage and Mr. Bechtold each seem to have had some degree of

success with the species tomentella, but the writer's experience was that tomentella winter killed to the ground every year in Denver.

With the exceptions of the species pubescens and tomentella and Lake's adverse report on the hybrid chinensis alba at Gunnison, (chinensis alba reported as growing well in Denver), no other species or hybrids were reported as not liking our Colorado climate.

The following is a tabulation of the Colorado survey on the species other than Syringa vulgaris and its modern named varieties:

Votes		Colo. Aver- age	Nat'l Aver- age	EARLY HYBRIDS	
			6.1	LOUVOIS (Lem. 1921)	Violet
			7.0	VILLARS (Lem. 1920)	Lilac
2	6		7.2	OBLATA DILATATA (China 1917)	Pink
2	6		6.9	LAMARTINE (Lem. 1911)	Pink
			7.3	CATINAT (Lem. 1923)	Pink
			7.2	NECKER (Lem. 1920)	Pink
			6.4	BUFFON (Lem. 1921)	Pink
			6.6	MIRABEAU (Lem. 1911)	Lilac
			8.0	ASSESSIPPI (Skin. 1935)	Lilac
			7.7	MONTESQUIEU (Lem. 1926)	Red-purple
			7.3	POCAHONTAS (Skin. 1935)	Purple

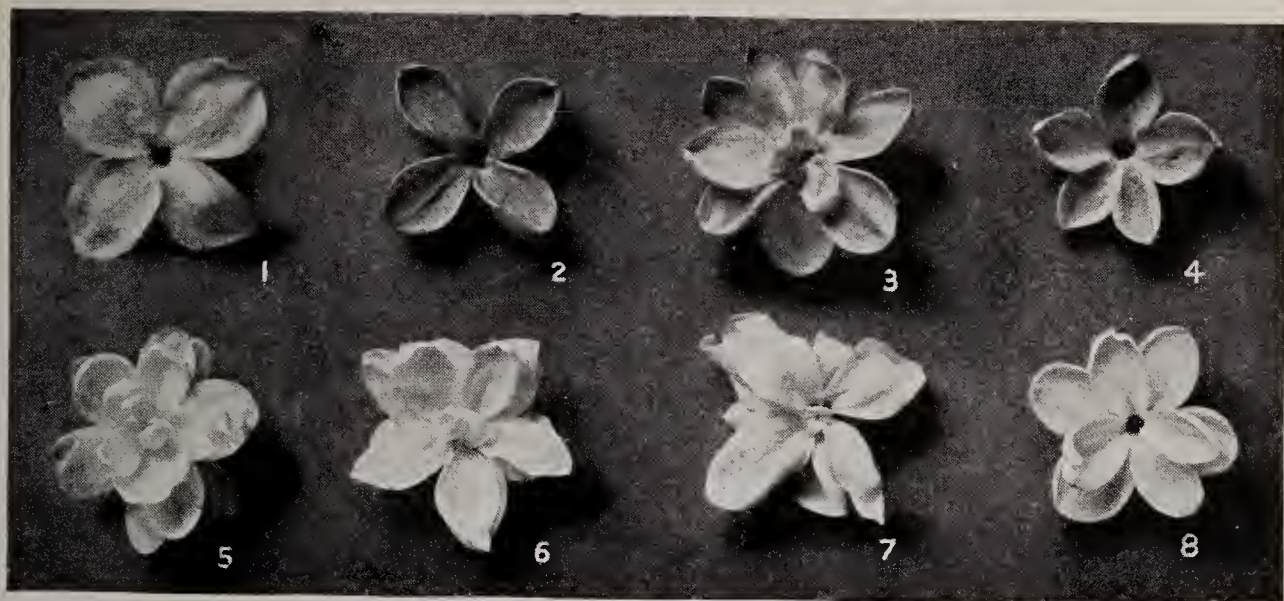
MIDSEASON SPECIES AND HYBRIDS

5	7.3	6.5	PERSICA
3	7	6.9	CHINENSIS (1796)
1	8	6.4	CHINENSIS ALBA (1885)
		8	CHINENSIS SAUGEANA (1885)
1	8	8	CHINENSIS METENSIS (1871)

LATE SPECIES AND HYBRIDS

8	5.3	6.2	VILLOSA
6	6.3	5.5	JOSIKAEA
4	6.5	6.6	HENRI LUTECE (VILLOSA X JOSIKAEA, Henry 1900)
1	7	7.3	MICROPHYLLA
3	3.7	7.1	TOMENTELLA
1	5	7.6	REFLEXA
3	7	6 to 8.1	PRESTON HYBRIDS (VILLOSA X REFLEXA AND VULGARIS X REFLEXA)
2	3	7.4	PUBESCENS
1	7	7.4	AMURENSIS
4	7.5	7.9	AMURENSIS JAPONICA
4	7	5.2	PEKINENSIS

Principal Variations in the Construction of Lilac Florets



This illustration by courtesy of Farr Nursery Company, Weiser Park, Pa.

EXAMPLES OF ABOVE TYPES OF FLORETS

- Type 1: Christophe Colomb, Lucie Baltet, Macrostachya, Capitaine Baltet, Congo, Marceau (deeply cupped), Massena (wide petals but deeply cupped), Mme. F. Morel, Reaumur, Jan Van Tol, Mont Blanc, Vestale, Firmament, Glory (Night is similar, but petals not quite so wide).
- Type 2: Bleuatre, Decaisne, De Miribel, La Place, Ludwig Spaeth, persica, chinensis, josikaea, Diderot.
- Type 3: Jeanne d'Arc, Belle de Nancy, Pres. Fallieres, Waldeck-Rousseau, Comte de Montebello, Marechal Lannes, Adelaide Dunbar, Charles Joly, Mrs. Edward Harding, Henri Martin, Pres. Poincare.
- Type 4: Pres. Lincoln, Jacques Callot, Monge.
- Type 5: Edith Cavell, Ellen Willmott, Jules Simon, Leon Gambetta, Wm. Robinson, Katharine Havemeyer, Thunberg.
- Type 6: Mme. Casimir Perier, Emile Gentil, Jean Mace, Rene Jarry-Desloges, Leon Simon.
- Type 7: Mme. A. Buchner, Jules Ferry, Paul Thirion.
- Type 8: Pres. Grevy, Georges Bellair, Vauban.

Some years ago John C. Wister (15), outstanding American authority on Lilacs, said: " 'Come down to Kew in Lilac Time,' that beautiful poem of Alfred Noyes, . . . had an effect its author never intended, namely to create the impression that to see lilacs at their finest one must visit Kew. . . . The truth is that our cold winters and hot dry summers are exactly what Lilacs like best. . . .

"America—from Maine to Virginia and west to the Rockies—(and far up into the Colorado Rockies almost to

timberline)—is the Lilac paradise." Part in parentheses is inserted by us.

As this report of the first survey of Lilacs for Colorado comes to a close the leaves are turning on the plains and in the mountains—and the chrysanthemums are coming out to dare the autumn sun to die. It is time for fortunate Colorado gardeners who would, in the spring, have "Lilacs in their doorway bloom," to carry out plans they made last May for planting some. They have boundless wealth from which to choose.

(15) John C. Wister, "The Lilac Line-up for Gardens Great and Small," *House & Garden*, Vol. 65, March 1934, p. 27.

THE GREEN THUMB

GEORGE W. KELLY, *Editor*

4849 South Santa Fe Drive

Littleton, Colorado

MRS. PAUL H. HADLEY, *Associate Editor*

A Bulletin of the

Colorado Forestry and Horticulture Assn.

Organized in 1884

“To preserve the natural beauty of Colorado; to protect the forests; to encourage proper maintenance and additional planting of trees, shrubs and gardens; to make available correct information regarding forestry, horticultural practices and plants best suited to the climate; and to coordinate the knowledge and experience of foresters, horticulturists and gardeners for their mutual benefit.”

Published bi-monthly. Sent free to all members of the Association

Annual memberships \$1.00 Sustaining memberships \$5.00 Life memberships \$25.00

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LILAC, LEON GAMBETTA
(on opposite page)
Courtesy Farr Nursery Company







The Green Thumb — JANUARY, 1945

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A Bulletin of the

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VOLUME 2

JANUARY, 1945

NUMBER 1

George W. Kelly, Editor

4849 South Santa Fe Drive

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Mrs. Paul H. Hadley, Associate Editor

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PLANS AND PLEAS

This issue begins a new year for THE GREEN THUMB. As we compare this issue with the first one published we are pleased to see quite an improvement. The first year of publication has established the fact that such a magazine is needed in this area. Where we go from here and what further improvements are made depend very largely on each of the present subscribers.

First, to put the Green Thumb on a sound financial basis we need to at least *double our membership*. If the present members think that this is a worthwhile project, they can easily bring in the additional members by telling their friends about the organization and magazine.

It has been a pleasure to work with this Green Thumb family; everyone has been so willing to help.

Now we need your further help in securing new members and in giving us your suggestions for improvements. We would like to have the contents of the magazine satisfy the needs of the greatest number possible of the Horticulturists and Foresters of the state. Will each of you take it as his personal responsibility to let us know what you would like to see in this publication. We want it to cover the problems of the whole state. Its aim will always be to supply information regarding Horticulture and Forestry as it applies to Colorado.

Another way all members may help us greatly is to send in your renewals of membership for 1945 immediately. This will save a great deal of time on the part of our secretary.

VIBURNUMS FOR COLORADO

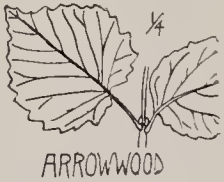
A Summary of our Recent Survey

The genus *Viburnum* includes many of the very fine shrubs for ornamental planting in Colorado. As a group they do not have the spectacular colored bloom of the lilacs, or the brilliant fall color of the sumacs, or the showy fruit of the mountain ash, or symmetry of the spireas; but they do have a combination of a degree of all these good qualities; which makes them really a family of aristocrats. The genus shows a great variation in size and character of growth, in color of fruit, and especially in character of leaves. A complete and satisfying home planting could be made of viburnums alone. Several species commonly used in the east are too tender to be of value here, but our recent survey shows that at least a dozen kinds are useful here. As a group they prefer a rich moist soil, and while some require partial shade, most of them will grow

anyplace that has good garden soil. Our survey shows three or four kinds quite widely used in Colorado, but it also indicates that as many more could be used in appropriate locations.

For convenience we will divide the recommended kinds into three groups: those with divided leaves; those with thickish, woolly, or prominently veined leaves; and those with entire, thin, green leaves.

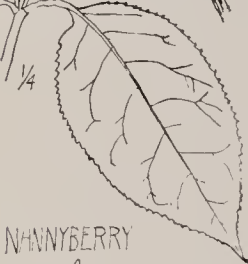
The best-known member of the first group is the common old-fashioned Snowball (*V. opulus sterile*). This makes a large spectacular shrub with its round white balls of bloom, but of late years it is losing favor because of the damage done to it most years by aphids just as the new leaves open. These damaging aphids begin their work as soon as the leaves unfold, and immediately cause the leaves to roll around them. mak-



ARROWWOOD



WAYFARING TREE



NANNYBERRY



SNOWBALL & CRANBERRY



BLACKHAW



SARGENT CRANBERRY BUSH

ing them almost impossible to reach with a killing spray or dust. The best solution of this is probably to keep the plant free from aphids late in the fall just before the leaves drop. Then there can be no eggs left to hatch early next spring.

The fruiting form of this species, called the European Cranberry Bush, or Highbush Cranberry, is almost as well known as its cousin above with the college education. The common name, "Highbush Cranberry," is applied to two closely related species; *V. opulus* and *V. americanum* (trilobum). *V. opulus* is the European form and the best known. It grows tall, and is sometimes rather scraggly and leggy. The

fruit of all in this class is a bright red. The fruit of *V. opulus* hangs on for a long time through fall and winter, as it is too bitter for even the birds taste. After a few freezes it develops the characteristic viburnum odor. This peculiar disagreeable odor is found in the roots of all viburnum and the leaves or fruit of many. The nurserymen refer to it as resembling that of a fat man's socks.

V. americanum is the American form of the Highbush Cranberry. Some think that the fruit is not as attractive as the European species, but that the habit of growth is nicer, and the flowers better. The fruit of

this species are rather large berries and generally edible. The U. S. Department of Agriculture has developed several named varieties, useful especially for their fruit.

In this class comes a little known but superior species, the Sargent's or Manchurian Viburnum (*V. sargentii*). This has a denser, more upright habit of growth than the other two species, and also has edible fruit. Unless some fault, not now known, shows up; this species may, in time, take the place of the other better known species.

Another little known species in this class is the Pigmy Snowball, a dwarf which seldom gets over a foot tall. It seldom blooms or fruits, and it requires some protection. Used in the right place it is a valuable little shrub.

Our native Viburnum (*V. pauciflorum*) comes in this class. It is found rarely along our small streams in rich moist soil and dense shade. As the name indicates it is very sparing of its bloom and fruit. It is difficult to transplant, and deprived of its favorite environment it is most unhappy in cultivation.

The best representation of the second class is the Wayfaring Tree (*V. lantana*). This is the most popular and probably the most useful viburnum for use in Colorado. It is a real aristocrat of shrubs. It is rather slow growing, but in time makes a beautiful, large, dense, shrub. The blooms are the usual large flat cluster of small white flowers, but the fruit is very attractive. It is at first green, then yellow, orange, red, and finally black; and as it ripens gradually there are times when all these colors show in concentric rings in each head. The leaves are thickish, prominently veined and woolly underneath. The smaller stems are also brown woolly. It grows in any good soil in sun or partial shade.

The Fragrant or Korean Viburnum (*V. carlsi*) has been much advertised the past few years. It is

very much worthwhile when given a suitable location. A protected spot on the north or east of a building suits it best. It never makes a large shrub, and unless given good soil and protection is more likely to grow smaller, year by year, than larger. When it is happily located it produces large heads of beautiful pink buds which gradually open up into creamy white, highly fragrant, flowers. If you are able to pamper it, it is a delightful thing.

The Gardenia Viburnum (*V. burkwoodi*), is a still later introduction. It is a cross between *V. carlsi* and *V. utile*, and has much the same appearance as the Fragrant Viburnum. Some report fair success with it, but many others have found it more difficult than *V. carlsi*. Until more years have passed to allow more experience with it, it is best to class it with those shrubs which are very nice if they grow, but are of doubtful hardiness.

The Japanese Snowball (*V. tomentosum*), so far as leaves are concerned would be in this class, but is generally of little value to us here in Colorado. Several have reported fair success with it, but many more report no luck at all. Evidently under very favorable conditions it will live and grow.

There are several species in the third class which are good for use in Colorado. The Nannyberry or Sheepberry (*V. lentago*), is the best known and most generally successful. It will grow and prosper in any average garden soil, and will stand full sun or some shade. Its general effect is neat and light, although it becomes a large shrub in time. The bloom is in the usual flat head, and the fruit is rather large blue-black berries. The leaves are oval, entire, smooth and sharp pointed. The winter buds are very long tapered. This is a shrub which is worthy of greater use.

The Black Haw (*V. prunifolium*),

is similar in many respects to the Nannyberry; but has a generally more twiggy, horizontal effect; and will grow in drier, sunnier places. The fruit is large and edible. The leaves are similar to those of the Nannyberry, but blunt pointed. Few people in the state seem to be using this species, but there is no reason why it should not be used more often.

The Arrowwood (*V. dentatum*), follows the Nannyberry in popularity. It is generally of slower growth, and has usually a lighter effect. It will stand almost complete shade, and when so planted will usually grow tall and slim. Where it has more sun it will be lower and denser. Several people in the state have had trouble with it. There are two probable reasons for this. It will not thrive in quite as poor soil or hot sun as other species; and as there are several other species which resemble it closely it is often confused with them. Some of these other similar species, particularly *V. molle*, are much more difficult, or impossible in Colorado. The fruit consists of heads of tiny blue-black berries which the birds enjoy. When planted in the proper situations, this shrub should be used much more.

Several other species of Viburnums have been tried in Colorado and found wanting: *V. alnifolium*, *V. acerifolium*, *V. cassinioides*, *V. siebaldi*, and *V. dilitatum*. One or two people have had some success with some of these, probably in favorable locations, but in general they do not appear to be worth the effort. Many more species of Viburnum are listed in Bailey's Cyclopedia and in Eastern catalogs. Some more of these may in time prove useful here. We need that proposed arboretum to begin experiments with this group of plants and many many others. Those plants which have so far become known in the state have been discovered by the haphazard trial and loss method.

MEANING OF SOME VIBURNUM SPECIFIC NAMES

Opulus, luxurient.
Sterile, bearing no fruit.
Lantana, an old Greek name for Viburnum.
Lentago, tough, pliant.
Dentatum, with toothed leaves.
Nanum, dwarf.

Prunifolium, plum-like leaves.
Molle, soft-hairy.
Pauciflorum, few-flowered.
Acerifolium, maple-like leaf.
Alnifolium, alder-like leaf.
Tomentosum, dense with soft hairs.
Cassinoides, cassine-like.

WHO HAD THE FIRST GREEN THUMB?

By M. WALTER PESMAN

We still think our Colorado Thumb was green quite a while before the National Garden Contest "adopted" our slogan or trade-mark. Incidentally, if Washington liked the name well enough to use it nationally, it is a feather in the cap of the Colorado Forestry and Horticulture Association. And their clever illustration of the green-thumbed Mickey Mouse has an appeal for young and old.

Colorado awards in this National Green Thumb contest were made on November 16. A bronze medallion ("La Terre") will go to the three prize winners: Miss Lula R. Morse, 3768 Perry Street, Denver, in the Adult Division; Wayne Delventhal, Brighton, in the High School Division, and Barbara Ann Bocovich, Colorado Springs, in the Elementary Division. These three will also compete for the national awards, a thousand dollar war bond and two \$500 bonds. Awards were made on the basis of the Green Thumb Record Books, entered by the contestants, and showing both what was planted and what was harvested.

The actual record of produce is a

source of amazement to anybody who never took the trouble to keep track of the amounts raised. A small garden, 30 by 30 feet produced six hundred pounds of vegetables consumed by the home folks (and guests), in addition to 71 pints and 9 quarts canned and 111 pounds stored. And the total cash outlay was only around ten dollars! Miss Lula R. Morse, the adult winner, grew 32 vegetables and 25 annuals in her 1400 square feet of plot.

Wayne Delventhal, the High School winner, in addition to the \$76.80 worth of fresh food produced, sold \$102.50 worth, and gave away a lot more—all on an outlay of \$16.50 for seed and \$7.25 for insecticides.

Competition was quite close, especially in the adult division. Honorable mention in this division went to R. McDowell of Colorado Springs and M. Walter Pesman of Denver. In the high school and elementary school divisions honorable mention went to Verna Moore, La Veta; Vanita Hall, Peyton; James Rodgers, Arvada, and to Patricia and Billy O'Neill, Denver.



QUERCUS QUIPS

THE JARGON OF BOTANY



I could but be amused at the spirited defense of his three "friends" presented by Squire Stockbridge after his feckless insouciance towards all native plants—and things—these many years. Now had it been *Childe Herald*, whose prose and poetry in his unique *Rocky Mountain Herald* exuberantly exalt our native sons and spruces, I should have been deeply impressed. Or even had the doughty Scot at 38th and Wadsworth bespoken his Moor, or whatever it is they have in Scotland, or Buffalo, the matter would have been serious. But Squire Stockbridge, who finds his greatest joy in the manuroma of Spring processes, and the agonies of poisoned angleworms—if he be the champion selected to switch us from *Spiraeas* to Sagebrush and from Babybreath to Skunkbush, then I am content to let the matter die a natural death (and then after thorough decomposition, be added to the Squire's reeking compost pile).

However, the subject chosen for discussion this month concerns our High Church devotees of things horticultural rather than the vermiculations of the Squire's soil tillers. A few years ago I suddenly aspired to be truly scientific. Being stationed for the winter near one of our classic and ivy-clad institutions of learning upon the American Thames, I enrolled as a student in a class in taxonomy. After four humiliating months, I returned home well content to learn my plants via field trips with

members of our Colorado Mountain Club. For the botanist, you will understand, can never use a word the meaning of which is clear, when it is possible to employ an obscure synonym. I quote from class notes I took at one of the earlier lectures:

"The configuration of juvenile

Pinus strobus is attenuate, seldom furcate with muticous strobili."

According to a standard glossary, the professor meant that young White Pines are slenderly tapering, seldom forked, and have cones that are unarmed. Why couldn't he say so! Similarly, we laboriously learned—and promptly forgot—that the *baccate* fruit of the currant is "berry-like," that the *coriaceous* leaves of the Oregon Grape are "leathery," that *viscid* leaves are "sticky," and *velutinus* ones "velvety."

Of course we must call things by their names: An anther is just that, and no one can object to calling a node by that terse, descriptive title. Sometimes, in wholly scientific journals, the shorthand of technical terms may save a number of pages and justify itself in part. I will wager much, however, that if we could mesmerize most botanists and then wring the truth from them, we should find that the fundamental reason for calling a wrinkled seed *rugose* and a swollen one *tumid* is primarily to show the other wise men that there is still another present.

QUERCUS.

SANCTUARYS IN THE PLAINS

By JULES S. RENAUD, *Associate Forester Soil Conservation Service*



Cut courtesy Littleton Independent

All of us have driven along the highways in Eastern Colorado and enjoyed seeing farm and suburban homes nestled within a windbreak of trees and shrubs, homes that have a permanent look, homes where satisfied Colorado people are enjoying life in their own green sanctuary.

All of us, too, have seen farm and suburban homes sticking up like sore thumbs on acres barren of trees or shrubs, with all the ugly tools and machines of man exposed to the view of everyone passing by. The look of impermanence is everywhere as if the owner really didn't have faith in his own ability to make his home a permanent, enjoyable place to live.

Trees and shrubs have the merciful ability to clothe nature's ugly spots and provide shade, shelter and food for man and his animals.

Early settlers planted thousands of trees and shrubs under the Tree Claim Act, but many died because of a lack of understanding of the best technique of planting and care. Trees that were planted were those the settlers had lived with all their lives in the middle and eastern states and were not suited for the dry plains country.

Few trees grow naturally in the Great Plains area east of the Rockies except along streams, but windbreaks

can be successfully established by carefully observing a few fundamental principles. Insufficient moisture and competition by grass have always made it difficult to grow trees in the plains, but these are not insurmountable obstacles. We cannot make it rain more, but we can follow the practice of fallowing and increase the moisture available for newly planted trees and shrubs. The competition of grass can be eliminated by continuous clean cultivation around tree plantings.

Years of trial plantings by the Soil Conservation Service and other agencies have shown that at least ten species of trees and shrubs are well adapted for plains plantings, and the same trial period has revealed the best spacing in and between the rows of the species used. The following procedure is now being recommended to farmers and ranchers of Eastern Colorado:

The best windbreak has been found to consist of seven rows of trees and shrubs placed in an L shape to the windward sides of the house and yard at a distance of at least 100 to 500 feet away from the nearest building. Plantings too close to the house or barn deposit snowdrifts in the yard and plantings over 500 feet away are too far to effectively protect the house and yard from cold, drying winds. Windbreaks of less than seven rows usually do not give adequate protection.

A good windbreak should have three forms of plants. Tall evergreens for winter protection, tall hardwoods for summer protection and shrubby species for preventing wind movement close to the ground. Such a planting would consist of Ponderosa Pine in row No. 1 nearest the buildings, Rocky Mountain Red Cedar in row No. 2, Green Ash or

Hackberry in row No. 3, Chinese Elm or Hackberry in rows Nos. 4 and 5, Russian Olive in row No. 6 and in the outside row No. 7, either Squawbush, Tamarix, Currants or Chokecherry. Black locust could be substituted for Green Ash, Hackberry or Chinese Elm, but it is subject to the locust borer in Colorado. Wild Plum could be substituted in the seventh row but is a host plant for peach mosaic.

On dry land trees in rows Nos. 1, 2, 3, 4, and 5 should be spaced 16 feet apart, in row No. 6 six feet apart and in row No. 7 four feet apart. On irrigated land trees in rows Nos. 1, 2, 3, 4, and 5 should be spaced 12 feet apart, in row No. 6 six feet apart and row No. 7 four feet. Spacing between rows depends upon the type of cultivating machinery available, but should be between 12 and 16 feet for all except the rows Nos. 6 and 7 which should be at least 8 feet apart.

Windbreaks should, of course, be fenced to prevent grazing by cattle, sheep or horses.

Many older plantings which followed the above principles are out-

standing in their effectiveness. M. N. Bailey, whose dry land is located southeast of Simla, had a fine crop of cherries last summer where the trees were protected by a windbreak; and just a little way east Warner Paul has a high producing patch of blackberries, strawberries, and raspberries and a fine vegetable garden all protected by an 18 year old windbreak, where the Ponderosa Pines are now 20 feet in height. These gardens are in the zone of protection from living green walls and are producing fruits and vegetables on a site that would be extremely unfavorable without protection.

Wheat, corn, sorghum and other field crops will likewise increase their yields where protected by a good windbreak. It is pleasing to see more and more green rows of trees dotting the landscape throughout Eastern Colorado, proclaiming to everyone who passes by that here lives a permanent farmer, one who is sinking his "roots" deep in the earth—into the good Colorado soil that will give up to him and his children crops in abundance forever.

NATIONAL GARDEN CONFERENCE

Gardening for Beauty Emphasized

Ornamental gardening supplanted food in primary attention at the national victory garden conference held under the auspices of the United States Department of Agriculture, at Washington, D. C., November 28 and 29, in contrast to the original gathering held under the shadow of the Pearl Harbor disaster. About 125 persons represented garden organizations, civic groups, horticultural trade interests and governmental agencies.

They studied the results of victory gardening efforts so far in the war period and considered the need for their continuance. Consideration was given to a national garden program

in the postwar period for its aesthetic value.

The first conclusion reached by the conference was to continue the promotion of victory gardens with a national goal of 20,000,000 gardens in 1945. Other conclusions reached by the conference were embodied in the recommendations of five committees, which were submitted to the conference as a whole and adopted unanimously. Among these were recommendations that practical gardening be taught in the public schools, the trend to include ornamentals in victory gardens be encouraged, home planting of fruits be fostered, state extension services be extended to

urban communities as well as rural districts, efforts be intensified to expand roadside plantings, and commemorative plantings be established throughout the country.

Reflection of the increasing importance of ornamental horticulture appeared in several recommendations adopted by the conference. One was that a division of ornamental horticulture be set up in the bureau of plant industry of the United States Department of Agriculture. Another was that one or more specialists in ornamental horticulture be employed in each state. Still another was that a specialist in ornamental horticulture be engaged by the extension service of the United States Department of Agriculture to coordinate the extension work of the various states.

One of the speakers, H. W. Hochbaum, of the extension service of the War Food Administration, said in part: "Victory gardeners, rightly so, are including the growing of some flowers in their home gardens. This broad interest, where space permits, should be encouraged that flowers as well as vegetables grace the family table. Coupled with this should be every encouragement for the beautification of home grounds, lawns, shrubs and trees; that the home place may be made as attractive as possible, by screening out unsightly vistas and objects, obtaining privacy and providing an outdoor living room for recreation. We are coming more and more to appreciate the outdoors. When the backyard is made to be an attractive adjunct to the house, we can more easily enjoy the sunshine, fresh air and cheering greenery which should be every family's right and pleasure."

"Deeper than this is the need for stimulating a much greater national interest in the problem of civic and countryside improvement and beautification, that everyday living may be made more beautiful and enriching. Local and state garden committees can well build on the great current

interest and experience in gardening and develop appraisals of local situations and needs, then organize a postwar program of recommendations which public and private groups may accept and gradually carry out. Included in such appraisals and programs may be (1) the need for parks, parkways and playgrounds; (2) the improvement of approaches to towns and cities to make them more sightly; (3) the improvement of housing conditions in industrial and low income areas; (4) planning projected housing developments to provide maximum outdoor space, lawn, trees, greenery and recreation; (5) obtaining the cooperation of property owners and real estate subdividers so to plan new residence areas that sufficient garden space will be provided for each lot, and that the planning and layout of the streets and alleys will be such as to make for the most harmonious and beautiful living surroundings; (6) improving and beautifying waterfronts and adjoining country and woods areas; (7) landscaping of school grounds, public buildings and churches, and improving and better maintaining cemeteries; (8) removing unsightly roadside stands and advertisements; (9) encouraging nurserymen to recommend and provide some of the more desirable kinds of plants for foundation planting and the landscaping of home grounds."

Old Mrs. Hope was the grande dame of our town, but in any business deal she always seemed to come out victor. It took a red-headed Scotchman to cut her down to her right size.

She had ordered Angus, our local Scotch florist, to plant 500 tulip bulbs. When he presented his bill she said, "I'll pay you when they come up."

Angus started digging. "Madam," said he, "They're coming up damn quick."

—Lucretia Wyman,
in *The Reader's Digest*.

SPRUCE BEETLE INFESTATION FOLLOWS BIG BLOW DOWN

By JOHN W. SPENCER, *Regional Forester*

Late in 1942 a well-defined insect epidemic was discovered in the Engelmann spruce stands of Western Colorado. Already widespread at this date, cooperative preliminary investigations by the Forest Service and Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture, revealed that 510,520,000 board feet—over 17 per cent of the original green stand in this type—was dead on the stump in the White River National Forest alone!

So rapid has been the spread of this epidemic, caused by the tiny, dark brown beetle *Dendroctonus engelmannii* Hopk., that at the present time, estimates of the White River timber killed has leaped to 1,783,650,000 board feet; with losses on the Grand Mesa, 18,000,000; on the Routt, 7,600,000; and on the Uncompahgre National Forest, 3,000,000 board feet. In terms of Colorado's national forests operable Engelmann spruce stands, this represents 16.5 per cent of the total—and, since the great bulk of Engelmann spruce in the state is in its national forests, the figure becomes even more significant.

Although the present infestation is following the geographical outlines of the big blow down of 1939, minor outbreaks beyond its general path are being reported to the Forest Service from time to time. For example, on the Black Mesa of the Gunnison Forest, some 2,000 trees are now dead; and on the Holy Cross, in addition to several isolated infested Engelmann spruce, four separate areas, involving about 1,500 trees, were recently discovered.

The blow down of 1939, the entomologists say, contributed materially to the build-up of the beetles to the present epidemic proportions.

The present epidemic of Engelmann spruce bark beetles is, without doubt, the most serious insect infesta-

tion with which this area has been confronted. The infestations apparently got off to a good start following the extensive damage, in the form of uprooted trees, which accompanied the heavy wind storm on June 15, 1939. In these weakened trees the beetles found an ideal haven, and built up their broods in tremendous numbers.

At the present time, all these forests have more or less extensive areas on which the known loss in Engelmann spruce timber is extremely severe. In fact, the attacks are so aggressive that the entire Engelmann spruce forested area may be threatened with complete destruction of all trees of saw timber size, and may even include many of the smaller trees. We can already foresee that in some places there will be no Engelmann spruce left to provide a crop of saw timber for perhaps the next century, or longer.

Outbreaks of forest insects have occurred before in Colorado. As early as 1905, forest entomologists found evidences of an epidemic that 50 years previously had swept what is now the Pike National Forest, particularly on the south slopes of Pikes Peak. Again, on what is now the White River Forest, in 1886, the beetle was particularly active, and destroyed perhaps 20 per cent of the mature spruce in the area between East Elk Creek and Deep Lake; and an examination of the infestation on the Grand Mesa, in August, 1943, showed that a severe epidemic swept the Grand Mesa proper about 75 years ago.

The present outbreak, however, is many times greater and more serious, especially since this merchantable timber will be sorely needed to meet the lumber needs in the next few years. The occurrence of the outbreaks, according to Dr. Noel Wy-



To all outward appearances, the Engelmann spruce trees flanking the middle example are alive and healthy. They are a fresh green, their needles are intact, and their branches are not indicatively drooped. They are the living dead, however—but only by the closest inspection could their actual infestation status be determined. The center spruce is, of course, a specimen by way of contrast—dead for some time, as a result of beetle attack, with all external evidence apparent.

gant, principal investigator in the present epidemic for the Bureau of Entomology and Plant Quarantine, probably coincides with maturity of the spruce stands and with periods during which climatic conditions or other factors are favorable for the development of the insect.

Since the crowns of the trees remain green so long (a full year or more) after they have been completely killed by the beetles, a serious infestation may be building up and not be noticed by anyone passing through the infested area. The most conspicuous indication of the presence of an infested spruce tree is the work of woodpeckers. These birds often nearly completely strip the bark from the lower portions of the trees in seeking out the larvae (under the bark). This, plus the presence of pellets of boring dust clinging to the bark crevices beneath the tiny, round hole where the adult beetle enters the tree, is all the evidence visible externally.

Actually, very little is known about the habits of the Engelmann spruce beetle. Thus, the investigative program during the current year, undertaken jointly by the Forest Service and the Bureau of Entomology and Plant Quarantine, was necessarily exploratory in nature. While both funds and experts to carry on the study were meager, nevertheless the extent and seriousness of the infestations were determined by surveys, a

life history of the insect was partially determined, and control measures of various sorts were tested.

This, and more information is urgently needed on which to base control work since, only after the insects' life cycle is definitely known, can intelligent planning be undertaken.

Although it is believed, based upon past experiences and history, that the epidemic is now perhaps at its peak and, through natural causes may be on the decline soon, for the present, its extent and virulence preclude any widespread control. Where incipient outbreaks occur, it will be necessary to instigate direct control measures. It is economically impractical and physically impossible, says Dr. Wygant, to carry out direct control measures effectively within the confines of the present infestation: the volume within these areas must be lost, but with the aid of natural barriers, it may be possible to prevent its spread to other areas.

The direct control phases of the work are being handled administratively by the Forest Service through sale of bug-killed but commercially salvageable timber. A score of such timber sales, located in the most heavily affected areas on the national forests, have already logged out millions of board feet of this spruce timber. It is steadily entering a demanding market as box shook and miscellaneous crating for use in the war.



CHARLES RENO ROOT

Pioneer Colorado Seedsman



CHARLES R. ROOT

The dean of Colorado Seedsmen, Charles R. Root, landed in Colorado 53 years ago on August 4, 1891. Born in Cato, New York, January 26, 1863 he, at an early age, invested a small amount of money in an "Excelsior" printing press and an assortment of type and went into the printing business, printing visiting cards and other small items. This small business prospered and, after having kept him in bread and butter for four years, he sold out for \$500.00 and traveled west to Lansing, Michigan, where he resumed his studies. He was staying with relatives and it was not long before he was back in the printing game, first in a printing office and later as a compositor for the Michigan Democrat, a weekly newspaper.

About this time, an older brother, operating the "J. B. Root Company, Seedsmen," one of the first seed houses in Rockford, Illinois, induced Charlie to come and work for him raising tomato, pepper and squash seed. He felt he would be more valuable to them in promotion work and soon prevailed upon them to let him install a printing press and, in 1888, he got out his first list for the seed trade. The following year, he got out a seed catalog listing, by the way, many varieties still being shown in seed catalogs, and of which he was very proud.

Owing to the illness of his father, he returned to Cato, New York, in the summer of 1889. During July of that year, by telegraph, he arranged with Clarence Bowman, manager of Barteldes & Company, to come to Denver.

He arrived in Denver, August 4, 1891, and the next day went to work for Barteldes & Company as a traveling salesman. Those were the days when a seed salesman went out during the summer and fall selling seeds and then worked in the winter putting the orders up. This Charlie did, and received the enormous salary of \$65.00 per month for his work!

In 1894 some changes were made in the Barteldes organization and Charlie was made manager, in which capacity he remained until he established his own business 21 years later. In 1906 he was responsible for the building of the Barteldes warehouse at 16th and Wynkoop Streets, a five-story building, considered one of the best of its kind in the city.

In 1912 he, with two associates, since deceased, organized the Colorado Seed Company at 1515 Champa Street, Denver.

Charlie joined the American Seed Trade Assn. in 1888 and for 53 years has been active in the seed business

in Denver and, after all these years, is still on the job every day.

He was one of the early members of the Denver Chamber of Commerce and on the Board of Directors of that organization when the present building was erected, serving on that board for two terms. He was for many years chairman of the Agricultural Committee of the Chamber. He was chairman of the National Dry Farming Congress from 1909-11; president of the Colorado Manufacturers Assn.; on the Denver Charity Board for three years; was president, and instrumental in the formation of, the Colorado Apple Exposition; was president of the Colorado Florists Club in 1912-13 and president of the Colorado Seedsmen's Assn. in 1924-25-26 and 1928. He is a charter

member of the Denver Rotary Club and a member of the Montview Boulevard Presbyterian Church.

In June 1893 he married Mary Whipple Freeman of Rockford, Illinois and has two daughters, one of whom was his "right-hand-man" for 25 years in the seed business. She was Miss Clara Root, well-known to the seed trade, and is now Mrs. Howard Gregory of Rockford, Ill.

Over all these years, Charlie Root has been admired by all with whom he has come in contact, and the seed trade, of not only Colorado but the entire country, recognizes in him a seedsman whose business dealings have always been based on honesty and integrity.

HOWARD F. ROERIG.

THE EDDY ARBORETUM

By G. THOMAS ROBBINS

NOTE: Arboretums and botanical gardens have been established in many states with valuable benefits to those communities. Colorado might well profit by these examples. Here is an account of one arboretum which has proven its value in California.

The Eddy Arboretum serves as the experimental ground of the Institute of Forest Genetics, a branch station of the California Forest and Range Experiment Station, operated by the U. S. Forest Service. The Institute's work, begun in 1925, seeks to develop by selection and breeding rapid growing strains of timber trees, especially pines, which will also possess resistance to insects and disease.

The Institute is located in the Sierra Nevada foothills, at an elevation of 2700 feet, near the early mining town of Placerville. It is situated in the heart of a region that contains some of the finest and largest stands of Ponderosa pine and Sugar pine in California.

The Institute has brought together

in its arboretum one of the most complete collections of pines of the world—including nearly 70 species and 25 varieties, in addition to a number of experimental hybrids. The moderate climate of the area permits the growing of species from many latitudes and many geographic strains of the same species are represented. In addition, there are 32 species of conifers other than pines growing in the arboretum.

Most of the 3700 trees in the Eddy Arboretum are now 15-18 years old and some of them up to 60 feet tall. The trees are arranged, not in park-like fashion, but in regular rows spaced 15 feet apart, principally to conserve space. They are in groups varying from 1 to 30 or more trees for each species and these in turn have been arranged in species relationship groups to permit cross-pollination. In addition to the arboretum there are several thousand additional pine trees growing in surrounding experimental plantations.

GROWING PLANTS WITHOUT SOIL

A. M. BINKLEY, *Horticulturist, Colorado State College*



At the present time there is considerable interest in growing plants without soil, which is no doubt due to the wide publicity and spectacular yields reported. It has appealed to the popular fancy of the amateur and the hobbyist, yet it does have possibilities for use by the commercial greenhouse grower. Soilless culture has been used as a technical tool for a long time, but it is only recently that its adaptation to large scale use has become of interest to the greenhouse industry. It is not adapted to outdoor use in the field except in localities, such as islands, where there is not sufficient soil or the soil is not capable of supporting plant life. The backyard gardener could use soilless culture as a hobby but the results as reported from those who have tried it are not very encouraging. Certain types of house plants can be grown without soil with proper equipment.

A brief discussion of soilless culture is given here with the hopes that it will bring about a better understanding of some of the problems involved. In water culture or gravel culture a chemical solution is used to furnish the necessary nutrient elements to the plant. The difference is largely one in the mechanics of supplying the solution to the roots.

Water Culture

Water culture refers to the growing of plants in a chemical solution, without a rooting media, such as gravel. The plant is supported by holders and the roots grow in the chemical solution. The term hydroponics has been coined, which means literally water culture. Crop plants, however, will not grow in pure water, but must have the necessary chemical elements in the solution for growth. Roots must have aeration or oxygen for growth so air must be bubbled

through the chemical solution for growth.

Plant physiologists have grown plants in liquid nutrient solutions containing the necessary chemical salts for growth for over 75 years. It has been used as a method of determining, under controlled conditions, the factors affecting plant growth. For example, if you were asking information on the effect of phosphate on a particular plant, it would be left out of one series of liquid solutions in which the plants are growing. This would then be compared to treatments with sufficient phosphate for growth and to a series where the phosphate quantity of the solutions varied. The iron, boron, copper and other minor element requirements of plants have been studied by this method. Thus the experimental use of the liquid solution culture is so planned as to be helpful in answering both scientific and practical questions. There are many different types of liquid nutrient solution cultures for different species of plants, and different techniques have been developed for experimental work. The plant foods necessary for growth are obtained from the liquid solution, instead of from soil, which means that the concentration of the solution must be maintained at the proper level. As the plant grows, the nutrients or plant food is taken up and the solution will change. The change may also cause the pH or reaction to change from acid to alkaline side. Water evaporates from the surfaces of the solution, and the plant loses water through use and loss from leaf surfaces. This means that the water levels and the chemical composition of the solution must be checked at regular intervals and necessary adjustments made. If the solution be-

comes too acid or alkaline, adjustments need to be made to maintain the reaction at the right level for growth.

Many of these checks must be done for both water culture and gravel culture methods of growing plants. In liquid solutions, air is bubbled through the solution to provide oxygen whereas in gravel culture the gravel media is flooded with the chemical solution at regular intervals during the day, which brings air or oxygen to the roots. Temperature must be maintained at the proper range for crops grown. These points are emphasized to show the importance of having someone familiar and experienced in growing crops without soil.

Gravel Culture

The gravel culture method has been found to be more practical to use because it is more adapted to large scale commercial growing of greenhouse crops. The Horticulture section of the college has been experimenting with gravel culture for over five years to determine (1) the best solution for specific crops; (2) to determine the best medium (gravel, sand, etc.); (3) bench construction; (4) number of floodings of the media per day; (5) adaptation of propagation and transplanting methods to gravel culture; and (6) other new ideas in the operation of the method of growing plants. The results of some of these studies have been published, are in preparation, or not yet completed. A few of the requirements of gravel culture are discussed in a general way, based on the work in the college greenhouses.

Bench Construction, Pumps and Tanks

Gravel culture requires concrete or waterproof benches so constructed that grooves in the bottom will provide drainage of the solution back into the solution tank. The tank, holding the nutrient solution, should

be made of waterproof concrete and located so the solution will drain back readily. The size of the tank required should be about the capacity of one-third the cubic content of the bench. The nutrients are pumped from the tank into the bottom of the gravel filled bench until it comes within an inch or two of the top of the gravel surface, then the pump is turned off and the solution allowed to drain back into the tank. The pump can be attached to the tank or be of a portable type. Time switches are available which can be set at time intervals to turn the pump motor on and off.

Solutions

The solution which has been found to be satisfactory for our conditions is a modified W.P. solution which contains nitrogen, phosphorous, potassium, calcium, and magnesium, iron and other minor elements added. The solution can be pumped into the gravel two times every 24 hours or as needed, depending on the stage of growth of the plants, the season of the year, weather and other factors.

Here it has been necessary to change the solution every two months for gravel benches of carnations. It is necessary that the solutions be tested twice weekly, and water levels checked daily.

Mr. August Mussenbrock, florist in charge of our college greenhouses, has grown successfully a series of crops over a five year period in benches. He has run the quick chemical tests on the solutions, tried out different practices and new bench construction and other ideas. These crops include carnations, snapdragons, chrysanthemums, stocks, sweet peas, tomatoes, hydrangeas, and other crops. The yields and quality have been outstanding considering the problems of temperature control and growing more than one crop in a small range. While there are still problems of adapting the method to commercial greenhouse ranges, it is

only by growing the crops on a commercial scale that the practicability of the methods can be determined. Large greenhouse operators are interested in gravel culture and even if started on a few benches many things of value will be learned about the nutrient requirements of specific crops of which can be applied to growing in the soil. Some of the advantages and disadvantages of growing crops in greenhouses by the use of the gravel culture methods are listed for comparison.

Advantages:

- I. Reduction of labor costs.
 - (a) Eliminates hand watering.
 - (b) No weed control necessary.
 - (c) Eliminates cost of changing preparation and fertilization of soil.
 - (d) Reduces haphazard methods of watering and fertilization.
- II. Better understanding of elements and their balance required for production.
- III. Soil borne diseases less of a hazard.
- IV. Lowers fertilization cost.

Disadvantages:

- (1) Higher cost of bench construction, tanks and equipment. (Original cost higher but could be charged off over a 10 or 20 year period.)
- (2) Diseases may be distributed by nutrient solutions.

- (3) Danger from insecticides running into nutrient solution. The gravel should be flooded with tap water or nutrient solution before spraying.
- (4) Requires periodic check on solution balance and reaction.
- (5) More knowledge required on commercial adaptation and balanced solutions for different crops.
- (6) Symptoms of minor element differences may show up on different varieties, especially iron, boron, manganese, and calcium.

Gravel culture is an interesting growing method and undoubtedly will be widely used in the future, particularly where quality and yield are important. In all the experiences in growing crops by the gravel culture methods on a commercial basis at the college, the least difficulty is with the solutions used and their adjustment. More difficulties are encountered in the mechanics of operation. It does however, require someone trained and experienced in gravel culture methods. It does not require a technically trained chemist, or someone with a Ph.D. degree to be successful in growing or in the supervision of the method. Gravel culture will increase in use by greenhouse growers as soon as it can be proven to be more economical and that better yields and quality of crops can be produced.

Visitors are always welcome at the college greenhouses.

SURVEY OF ELM SCALE COMPLETED



As previously announced in the GREEN THUMB, a special committee was appointed to make a survey of and report upon the European Elm Scale in Denver. The original plan was to report the specific infested streets and areas. As the survey progressed, however, it soon became apparent that infestation was the rule rather than the exception. Every area in Denver has now been examined, and it appears that the distribution of the pest is universal, the only unaffected trees being those that have been given thorough care recently. As was reported in the November issue of the GREEN THUMB certain Parkways and Boulevards under city control which have been systematically pruned and sprayed by the city are in splendid condition. Certain of the Municipal Parks are in the same category. There are also a few private residences where regular care has been given and American Elms at such places are in fine condition. But by and large, unless most of the American Elms in Denver are pruned in the near future, and then thoroughly sprayed while dormant with miscible oil, the majority of Denver's magnificent American Elms will be eventually wiped out.

Infested trees are easy to spot. Mr. F. Herbert Gates, State Entomologist, pointed out in the November issue of the GREEN THUMB, that the branches of scale trees have a "black, sooty, sticky appearance." The smaller branches have, on their under sides, heavy incrustations of visible scale. Such branches soon die, and should be cut off and destroyed. Then a spray program should be instituted, along the lines suggested by Mr. Gates in his aforesaid report.

Complete cooperation in this project is being given by Mayor Stapleton, Manager of Improvements and Parks Cranmer, and City Forester Joseph A. Bixby, as well as by State

Forester R. E. Ford, the State Agricultural College at Fort Collins, and the U. S. Forest Service. All recognize that the situation is critical.

While the remedy is clear (pruning and spraying) the means of achievement are difficult because of the vast extent of the infestation and the present shortage of labor and equipment. The city is continuing to utilize its entire equipment and manpower on the Boulevards and in the Parks. Private home owners should lose no time in employing the numerous competent individuals and firms that are equipped to do this work. It is recommended that each elm spray job be reported to the City Forester, giving the location and date of the job, so that an inspector may be sent to test the quality of the spray, thus making it certain that proper standards are maintained.

It is further recommended that a newspaper and radio campaign be launched urging property owners to have their American Elms trimmed and sprayed before spring growth starts.

The infested trees are so numerous, however, that the committee feels that ultimately the city wide program will have to be carried out by the city.

Respectfully submitted,

Special Committee on Elm Scale.

Alfred J. Bromfield, Chairman.

Joseph A. Bixby,

R. E. Ford,

Col. Allen S. Peck,

Fred R. Johnson,

Robert E. More,

George Kelly,

S. R. de Boer,

M. Walter Pesman,

F. Herbert Gates,

Mrs. C. Earl Davis.

SEASONAL SUGGESTIONS — JANUARY AND FEBRUARY



You wonder what gardening work can possibly be done in January and February. Let us see if there are not some things which need attention.

January is always the seed catalog month. There will probably still be seed shortages so get your order in early. With several good seed catalogs with their bright pictures and alluring descriptions you can sit back before a warm fire and plan your whole seasons garden. The local seedsman are more likely to know what varieties are best for your location.

Trees can have necessary pruning done on them now. Fruit trees especially need a little work each year. Shade trees, except maple may be done now. Don't do much pruning on shrubs except to take out dead wood and straggly branches. Most blooming shrubs are better pruned right after they bloom.

Look over stored roots and bulbs, especially dahlias. If they are sprouting much they are probably too moist or warm. If they are shriveling they need more moisture. Some damp burlap over them will probably help.

Any time these months that there is a week or more of warm dry weather check your lawn and trees to see if they need water. Evergreens and birch trees need especial attention if the ground was not thoroughly wet when it froze up.

We might repeat that this is an excellent time to make garden plans, and to take up the study of some interesting phase of gardening.

Along in February it is fun to bring in a few twigs of such things as forsythia, pussy willow, spirea and plums to watch them come into bloom in the house.

If you can beg, borrow or steal any good manure, or compost, or peat; now is an opportunity to get it on your garden. It will be all ready to spade under when the ground thaws.

Possibly you can buy your plants cheaper than to raise them, but it is lots of fun to have your own hotbed and start them yourself. Beds should be prepared now.

As soon as the frost is out of the ground is the best time to start transplanting most trees and shrubs. If you are ordering some from a nurseryman the plans should have all been made before the planting season opens up. Birch and some slow growing trees are safer moved just before they come in leaf.

Check your house plants for insect pests.

The Green Thumb

A BULLETIN OF COLORADO FORESTRY AND HORTICULTURE

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PASQUE FLOWERS

THE GREEN THUMB

A Bulletin of the

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Organized in 1884

George W. Kelly, Editor

Mrs. Paul H. Hadley, Associate Editor

Leon C. Shoemaker, Office Manager

Room 14, 1608 Broadway — Phone TAbor 4673

Hours: 11 to 2 — Monday, Wednesday and Friday

"To preserve the natural beauty of Colorado; to protect the forests; to encourage proper maintenance and additional planting of trees, shrubs and gardens; to make available correct information regarding forestry, horticultural practices and plants best suited to the climate; and to coordinate the knowledge and experience of foresters, horticulturists and gardeners for their mutual benefit."

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PRESIDENT'S REPORT

Given at the Annual Meeting February 24, 1945

On behalf of the Board of Directors and the officers of the Colorado Forestry and Horticulture Association, I welcome you to this Annual Meeting; the first since the reorganization of the Association, and the 61st, since the organization of its predecessor, The Colorado State Forestry Association. Sixty-one years is a long time. I doubt if there are many groups in Colorado with such a long record of sustained effort. The objectives of the Association, "To preserve the natural beauty of Colorado; to protect the forests; to encourage proper maintenance and additional planting of trees, shrubs and gardens; to make available correct information regarding forestry, horticultural practices and plants best suited to the climate; and to coordinate the knowledge and experiences of foresters, horticulturists and gardeners for their mutual benefit," are worthy of great and continued effort into the future.

The year just closing has been one of activity and progress. Not less frequently than bi-monthly we have published and distributed to our members the official bulletin of the Association which we have called the "Green Thumb". It is our medium of contact between our board of directors, our officers, committees and our membership. Many interesting and instructive articles have been contributed by our members, all in furtherance of our stated objectives. The Lilac number was particularly outstanding, and has received wide praise, not only in Colorado, but in many states. Mr. George Kelly, our able editor, has made the bulletin a success beyond our most optimistic expectations, and the Association owes to him a great debt of gratitude for his contribution of time and untiring effort. He has been ably supported by Mrs. Paul Hadley, our assistant editor, and the members of the publication committee. To meet the cost of printing and distributing the Green Thumb it became imperative to increase our income from the membership dues. The lilac Christmas present number brought in many memberships. Mrs. Earl Davis, chairman, and others of the membership committee, ably and enthusiastically assisted by Mrs. Helen K. Fowler, have increased our membership from approximately 100 to over 1,000. We are most gratified for the interest which has been shown by the response of so many, and we will endeavor to make the bulletin, which goes to all members, of increasing value and interest.

For some time a severe infestation of scale on the American Elms throughout Denver has been apparent. Last fall the Association undertook a survey of its degree and extent. The attention of the public was called to the findings of the committee, by articles published in the Green Thumb, and in daily newspapers, urging need of trimming and spraying. It is certain that many beautiful elms have been saved that would otherwise have been destroyed. The Association gratefully acknowledges the cooperation in this effort by Mayor Stapleton, Manager of Parks Cranmer, City Forester Bixby, State Forester Ford, the United States Forest Service and the State Agricultural College at Fort Collins.

A proposal for the establishment of an Arboretum and Botanical Garden in Denver was urged upon the city authorities. The matter is uppermost in our minds and we hope it may become a reality in the not too distant future.

For sometime the need of centralized attention to the detail of our expanding activities has been apparent, at least on a part time basis, with regular office hours. We feel very fortunate that Mr. Leonard Shoemaker, formerly with the United States Forest Service, has consented to become our Treasurer and Assistant Secretary, and will give us this necessary and regular time. Through the courtesy of Mr. Irvin J. McCrary, office space has been made available for our headquarters at 1608 Broadway. Mr. Shoemaker will be at this office Mondays, Wednesdays and Fridays from 11 A. M. until 2 P. M. All communications may be sent to him. He will keep the membership records, handle receipts and disbursements and assist Mr. Kelly in the business details of publishing the Green Thumb.

From the bulletin you are familiar with the names of the chairmen and members of our various committees. From time to time their reports will be published in the bulletin.

I want to thank our officers, the members of the board, the chairmen and members of committees for their enthusiastic work and fine cooperation which has made this year of accomplishment possible.

Respectfully submitted,

GLADYS C. EVANS (Mrs. John Evans)

President.



FRUITS FOR COLORADO

By George K. Kroh, Loveland, Colo.

There need be no home garden without its fruit in some form in any of the agricultural areas of Colorado, and such possibilities also venture rather far up into our mountain valleys. Moisture to supplement natural rainfall is a sustaining requirement, whether from stream diversion, garden hose, or dryland windmill. Most all fruits prefer to stand with their roots out of water; thus soil drainage is also a factor of the other extreme.

The areas surrounding the lower Colorado and Gunnison river valleys in Western Colorado support the biggest assortment of fruit varieties in the state, and there peaches, apricots, sweet cherries, and even some vinifera grapes are a reality to commercial proportions. On the Eastern Slope, a more exacting climate moderates our choice, but we still have our staple fruits adapted to the central plains and in addition no one can deny us a venture in experimenting with the marginal tree fruits.

Native fruits, unfortunately, are not congruous with domestic or commercial conception of fruit, although the chokecherry, wild plum, wild strawberry and raspberries, and Buffalo Berry are some natives that cannot be altogether ignored.

Substantially all fruits planted in Colorado are an epitome of North American, European, and Asiatic ancestry. Our early settlers instituted the first experiment plot in the wide open spaces of the west, and from them, we derived the trend of adapted fruits. Academic refinement has later been applied to further horticultural experimentation with systematic collections of varieties for testing, and with scientific plant breeding. Plant genetics in skilled hands holds the key to alluring future discovery of better qualities of fruits blended with greater hardiness and adaptability.

Since most contradiction to degree of latitude lies in our Eastern Slope and Plains country, comments herewith will have a mile high viewpoint, looking from the mountains eastward. It is not the intention to enumerate local exceptions in parts of Colorado, but those varieties mentioned are characteristic of the respective cultivated species, and in most cases are suggested for planting in the areas.

APPLES: Crabapples as a class are the hardest of tree fruits outside of the native plum. Among the fine jelly varieties are the highly colored, crimson Dolga, Florence (somewhat dwarf), Siberian, Shields, Hyslop, and others. Whitney Crab is practically a small apple, and its crisp, juicy, sweet flavor in August is excellent. Summer apples maturing in July and August include Yellow Transparent, Red Astrachan, Duchess, Anoka, Early Harvest, and the very tasty Red June. Fall varieties are headed by Wealthy, a fine all-purpose apple that has a long season of use directly from the tree, and also has keeping quality for a few weeks after picking. Not so well known is Jefferis, with an unforgettable rich flavor and aroma. Late fall or winter varieties constitute the largest group of apples, including Jonathan, Red Delicious, Yellow or Golden Delicious, McIntosh, Cortland, Ben Davis and its strains, Winesap and related strains, Rome Beauty, Northwest Greening, Haralson, Sheriff, and many more. Some distinction in adaptability exists, and a few popular varieties including Golden Delicious, Red Delicious, Grimes Golden, Rome Beauty, and Winesaps should not be ventured too far against climatic hazards. Actual practise has pointed out that some varieties lacking hardiness stand up much better by budding or grafting the desired variety on the scaffold branches or trunk of a very thrifty tree, particularly crabapple. Sunscald of trunks is thus practically eliminated, and it seems the whole tree is tempered by the circulation of sap through the cells of the hardy trunk. Gradually finding its place here, McIntosh and its offspring Cortland should definitely be accepted among first-choice varieties for fine flavor and aroma, and stability of growth; also commended is the late keeping Harlson from Minnesota.

Dwarf apple trees have an appeal for diminutive size and early bearing; however, the Malling dwarfing root stock is susceptible to chlorosis in our alkaline soils, and a shallow rooting habit anchors them lightly against strong gusts of wind. The "One-Tree-Apple-Orchard", also popularized as "Quintuplet" apple is more likely to be a practical means of saving space on the small property, since it has a sturdier root structure. As many as five and six standard varieties are top-grafted on the trunk or branches of a single tree. A hardy, thrifty crab is the best type of supporting tree.

CHERRIES: By tree population, the tart cherry varieties rate first for Eastern Colorado, with ranking commercial production, especially in the northern part of the state. Montmorency is the ideal red pie cherry, with large size, and a pit that is readily removed; Early Richmond is another well known red variety, preceding Montmorency about ten days. English Morello, and a Morello strain known as Wragg ripen early in August, with fine large fruit having dark red to black skin and red flesh. The Morello is noted for early very heavy yields on trees that do not

(Continued on page 23)

FOOLPROOF PERENNIALS

By KATHLEEN MARRIAGE

Here is information for everyone by a person who knows her Alliums. Mrs. Marriage, of Colorado Springs, is an authoress well known both in this country and in England.

Since labor to maintain any perennials other than foolproof won't be available till "Johnny Comes Marching Home" we'll all have opportunity to find out by what's left in our gardens which *are* foolproof. But for new gardeners here are a few that seem to stand neglected and still behave reasonably well.

Peonies
Iris
Dictamnus
Campanula carpatica
Campanula glomerata
Mertensia coriacea
Oriental Poppies
Perennial Asters
Clematis recta grandiflora

Clematis davidiana
Clematis integrifolia
Erigeron macranthus
Echinops ritro
Anthenius tinctoria
Nepeta mussini
Alyssum saxatile
Anchusas

Anemone translyvania
Eupatorium ageratoides
Gypsophilas
Hemerocallis
Monardas
Plumbago larpentae
Saponaria ocymoides
Thalictrums

Most of above list should, with reasonably good soil preparation, grow and bloom well in our region if given one thorough watering a week—flooding, not a little surface sprinkling. They require little staking, trimming or manicuring: since they are 'easy' growers some will prove strong competitors. Such surface spreaders as Campanula glomerata, nepeta mussini and Monardas must be slapped down at intervals to curb their invasive ways and prevent them from elbowing their neighbors out of space and sunlight.

Botanical names? Since introductions of recent years have so far only scientific names of universal usage they are cheek by jowl with common names in our list. Christen them with common names if you wish but for heaven's sake see to it that no other plant bears the same common name.



How many entirely different plants are known in different parts of the world as Bouncing Bet, Bachelor's Button, Snow on the Mountain? Technical terms may seem so much hi-faultin' jargon but they do convey a precision of meaning impossible in more familiar language, and they have the advantage of being universal—"angustifolia" conveys the impression "narrow-leaved" to a gardener whether he gardens in Tasmania, Turkey or Texas.

But we're wandering from that easy garden. Among the above perennials may be planted generously self groups of Tulips, Narcissus, Crocus, Snowdrops and Scillas (just try to get them!) as well as a few groups of sure-fire lilies, especially such seven-inch-deep varieties as Regal and Tiger.

Most of these bulbs are found in their native home growing through a ground cover of herbaceous or of

shrubby plants and they enjoy just such company in the garden.

One satisfactory and easy method is to plant—say fifty tulips of Ellen Willmott and spang on top of them a group of *Campanula carpatica* or a few dozen *Narcissus King Alfred* with a surface of *Plumbago (ceratostigma) larpentae*. As well as comfort, and protection from the sun, for bulbs this arrangement provides an increasing foliage growth to help hide the fading foliage of bulbs for year after year performance with no attention except necessary water.

Cottage tulips seem to be more tenacious than Darwins. Like all perennials it is probable that their long-lasting depends largely on deep rich preparation of the ground. A store of food underground to provide three meals a day is a paying provision for plants too.

CLEMATIS FOR COLORADO



JACKMAN CLEMATIS



SCARLET CLEMATIS



SWEET AUTUMN CLEMATIS

Clematis includes some of the showiest flowers and many kinds may be raised here. They deserve more attention from Colorado gardeners than they have received. A few kinds are well known, such as the purple C. Jackmani and the Fall Clematis or Virgin's Bower, but the experience of those few who have tried several kinds indicates that many more are available for suitable situations.

Of the thirty or more replies to

the recent questionnaire, only five people reported experience with more than six kinds, while the total number mentioned was 32.

Some Clematis, especially the large-flowered kinds, are rather fussy; but there are kinds which are very easy to raise, and even the more difficult respond to proper treatment.

The genus Clematis includes plants in a wide variety of habits, sizes, colors and



WESTERN VIRGIN'S BOWER

½ Natural Size

hardiness. Some can be used to cover fences and lattice work, some are suitable for perennial borders and others are valuable chiefly for their masses of large bright flowers. The foliage of all is attractive and the plummy seed-heads of some are as attractive as the blossoms.

Most clematis prefer a loose, well-drained, moist, rich soil. They appreciate having their roots shaded, but their tops in full sun. Planting them at the north of a low wall or a group of shallow-rooted perennials is a good place. The climbers need a firm support, and a pergola, lattice or gateway usually affords the requirements of shade for the roots, and sun and support for the tops. It will pay to provide a good root-run for them by working up the soil for 18 inches deep and wide, mixing well-rotted manure, peat, leafmold or sand with the soil as needed.

Spring is usually the best time to plant in this country. If potted plants are used they should be set in this spot of prepared soil so that the crown will be about two inches below the surface when the ground is settled. If bare-root plants are furnished, a good plan is to make a mound of soil in the center of the hole to spread to roots over, keeping the crown two inches below the surface. A mulch of peat, leafmold or well-rotted manure will help to keep the soil cool and moist in summer, and a good mulch of these materials in fall will benefit the plant over winter. Well-drained soil is essential for Clematis.

To simplify our summary of the species and varieties of Clematis reported on, we will divide them into four classes. These are not strictly botanical divisions, but are based on the characteristics readily recognized by the amateur gardener. These classes will be: 1. Small-flowered climbers; 2. Medium-flowered climbers; 3. Large-flowered climbers; and 4. Low, herbaceous plants.

The best-known in the first class is the Sweet Autumn Clematis, *C. paniculata*. This was reported on favorably by 19 people over the state. It is covered with a mass of small, white, fragrant flowers in September. It usually kills back part way each winter but makes a good growth by blooming time the next fall. It is a native of Japan. Our native *C. ligusticifolia* is similar in flower, but blooms in the spring and is not fragrant. It is more hardy and vigorous in growth, being easily naturalized where it can climb over fences, stumps, rocks and small trees. Its white, fuzzy seed-heads are very attractive all summer and fall.

Another variety similar to the two above, but native to the Eastern states is the *C. virginiana*. It will grow here but has no particular advantage over the first two.

The next three in this class are all worthy of much greater use. They are not so rampant in growth or free-flowering, but have a grace and beauty which will be much appreciated. The Scarlet Clematis, *C. texensis*, (*C. coccinea*) has urn-shaped flowers which are a brilliant scarlet outside with a touch of pink in the throat which never opens wide. There will usually be a few blooms all summer.

The curly Clematis, *C. crispa*, is of a similar delicate habit of growth, but bears bell-shaped purple blooms. These two are natives of Texas.

The best yellow, small-flowered Clematis is *C. tangutica obtusiuscula*, from Mongolia. It is really a beautiful thing in spite of its name. It is of more vigorous growth than the two preceeding, and is at times a mass of yellow and later a mass of white plumes. It seems to be happy anywhere, and seeds itself readily.

Two other yellow kinds have been reported, but little is known of their habits. They are *C. serratifolia* from Korea, and *C. orientalis* from the Himalayas. *C. jouiniana*, with small

tubular lavender flowers is worth trying.

The second class includes those clematis which generally bear flowers two or three inches across and opening flat or recurved. The best known of these are the *C. montana*. *C. montana undulata* is white flushed pink. *C. montana alba* is white, and *C. montana rubens* is pink. They bloom only on old wood, and are usually killed back here, so are not as valuable for Colorado as others.

Our own *C. pseudoalpina* is a beautiful thing with purple to mauve recurved sepals, but rather particular as to its requirements. It needs shade, moisture and good drainage. It usually crawls rather than climbs. Duchess of Albany is a hybrid of *C. texensis* and one of the large-flowered kinds. It is a beautiful thing of medium-sized, bright pink, trumpet-shaped flowers. Few people have tried it in the state but the hardiness from the *texensis* stock should make it a worthwhile experiment. *C. viticella*, var. *Kremesina*, is a rich red medium-sized flower which has been successfully raised by several people in the state.

Of the large-flowered kinds, about as many people have had experience with *C. jackmani* as all other varieties put together. It is a grand vine when in full bloom with its large purple flowers. It is a little difficult to establish, but seems to do better than any other.

Twelve people had tried *Mme. Andre*, and recommended it. It is a bright red companion for the *Jackman* and only slightly less hardy.

C. Henryi, a large white, was next in popularity. *Ramona*, lavender-blue; and *Lord Neville*, dark plum-colored with white center, both had several friends. *Nellie Moser*, mauve with red bars; *Mme. Baron-Veillard*, late lilac-rose, *Ville de Lyon*, carmine-red, seem to be more difficult and were recommended by only one each.

Duchess of Edinburgh, double white, is of the *C. florida* strain which blooms only on old wood, so was reported as a failure here.

Of the herbaceous non-climbing kinds, most people were familiar with *C. recta*. This grows about two feet tall and has small white star-like flowers. It is grown in the perennial border and used for cut flowers. *C. recta grandiflora* has larger flowers. *C. integrifolia* is somewhat similar in habit of growth, but has blue urn-shaped flowers. These are easily raised and bloom from June to August. *C. heracleifolia* var. *davidiana*, bears tubular blue flowers in August and September.

C. douglasi is a native of our foothills, forming a compact low plant and is full of tubular purple flowers in June similar to those of *C. crispa*. *C. fremonti* is from Missouri and has bell-shaped purple flowers similar to the above. Another native, *C. scotti*, is sometimes referred to as a variety of *C. douglasi*. Mrs. Robert Bryden is a hybrid which grows more vigorously than the preceding and has masses of small light blue flowers.

The survey indicates that much more experimentation is warranted with Clematis in Colorado, and that at least twice the kinds could well be used here if given proper care. For instance, so far as I can determine, although there have been thousands of hybrids with natives from other regions, nothing has been done towards creating new kinds by hybridizing with our native clematis. This is another job for our Rocky Mountain Arboretum, when we get it.

For more about clematis, I refer you to Bailey's *Cyclopedia of Horticulture*, or the July, 1937, number of the *Bulletin of Popular Information* from Arnold Arboretum, or send for the beautifully illustrated circulars of James I. George & Son, of Fairport, N. Y., Clematis specialists.

GEORGE W. KELLY.

WILLIAM NEWTON BYERS, PIONEER

Here is the story of one of Colorado's early horticultural pioneers that everyone will enjoy reading. Written after much research by MISS OLIVE HENSLEY, gardening enthusiast, who is Librarian at Opportunity School.

There were farmers as well as gold-seekers among the colorful, vigorous settlers of our state; and William N. Byers, though his first claim to fame may be that of the West's leading early editor, was by knack and by nature, a farmer. Born on a farm in Ohio, in 1831, he was educated in that state, leaving there to travel as a surveyor, "seeing the country", until he settled in Omaha, in 1854. He stayed there until 1859, when he heard the call of the farther West, and came to Denver by wagon-train, "with his shirt-tail full of type, to found the Rocky Mountain News."

From the beginning he championed the cause of agriculture, sure that the state's eventual place in the sun would come through farming, even though mining seemed all-important at the time. So, though he personally investigated and chronicled its every exciting event in those turbulent times, and news of the mines most often made the headlines of his paper, his editorial pages were chiefly devoted to promoting the country's agricultural stature. History gives some of these same editorials credit for first presenting ideas out of which grew such great things as the Federal Reclamation Act, wheat farming in Colorado, and the beginnings of our famous sugar beet industry.

Soon after his arrival in the state Mr. Byers got himself a farm, a couple of miles from Denver, in what is now the Valverde district, within the present city limits, staking his claim as the pioneers did, since the Homestead Act was not made law until 1862. By the fall of that same year, he had found time to cultivate fifty or sixty acres of it, and his skill as a farmer is attested by the remarks of a fellow editor, Alfred Thomson, of the Miner's Register of Central City. "Here are melons of every

variety, vegetables of all kinds—potatoes, tomatoes, onions, eggplants, beets, peas, beans and everything that grows in this country. His corn will yield at least sixty bushels to the acre. Should the News Office fail to yield a sufficient income, there is no danger that Byers will suffer for the good things of life; for we presume that he will realize \$2,000 or \$3,000 per annum from this ranch besides supplying his own table."

Some one else remarked that the Rocky Mountain News Office during August of 1860 was a veritable exposition in itself, the first ever held in this region. Mr. Byers had invited farmers and gardeners to bring in samples of their grain and vegetables, the result justifying his optimistic judgment as to the soil fertility of the new country.

In 1861, though it would seem that these hardy adventurers had barely settled in after their long, hard journey across the plains, we find them calling a meeting for the purpose of organizing an Agricultural Society. This venture was backed by the News editorials, maintaining again that "agriculture is paramount, and without farming, gold and silver mean nothing."

In spite of this good propaganda, however, the idea was a little ahead of its time, and it wasn't until 1863 that the Society really came into being, with Mr. Byers as secretary and member of the committee for the drafting of the Constitution and By-Laws. Encouraged by this accomplishment, their eager minds jumped ahead to holding a Territorial Fair in the coming fall, under the auspices of the new organization. But even though Governor Evans joined in urging the idea, it didn't materialize until 1866, when Mr. Byers was among the exhibitors.

This first Fair was a great success, if we may believe the newspaper description, which exulted that "the size and quantity of our vegetables are wonderful to recent arrivals in Colorado. Turníps as big as pumpkins and weighing over fifteen pounds, together with beets that beat all creation. . . Corn raised on the highlands, 11 feet in height and ripe enough to defy the grasshoppers."

Though, at this distance from those early days, travelling sounds to us more like a chore than a pleasure, they did get around and in 1873 we find Mr. Byers attending the Agricultural Congress in Indianapolis, along with the delegates from 24 other states. He was then a member of the Committee on Public Lands.

In 1880, there were enthusiasts ready to undertake the founding of a Horticultural Society. Mr. D. S. Grimes was one of the leading spirits in its organization and became the first president, receiving seven votes, five more than Mr. Byers had. Perhaps the "sensible talk on the subject of fruit growing and its promotion", which he made at the meeting, raised his stock the extra five points. An editorial of that time urged that it was the duty of every man who had the welfare of his state at heart to contribute his mite to the success of the Society. It was decided that some subject of general interest to the farmers would be discussed at each meeting. The fact that the subject chosen for the first meeting was irrigation shows how vital it was to every one of them.

The Horticultural Society staged its first exhibition in 1881 in a tent 300 feet in circumference, made especially for the occasion. This enterprise had the backing of the florists of the community, of whom there were then seven, and of the professional growers of fruits and vegetables, of whom there were 65. The

interest of the townspeople in planting and beautifying their city is shown in the fact that, in addition to the local stock, 21 carloads of nursery stock had been shipped in that spring.

A later exhibition of the Society is of interest to us because of an announcement in the News that "the attraction for today's session, the concluding one, will be a paper on 'Shade Trees', which W. N. Byers of Denver, President of the State Forestry will read." This paper, telling of the trees which he had grown and the problems he had encountered and his conclusions thereon, is of such interest that it is hoped that it will be possible to print it in its entirety in some future issue of the Green Thumb.

Water, or the lack of it, played a leading role in the dramatic development of the West. Samuel Bowles, an early traveler, here, painted a grim picture of our country in 1885, which while certainly exaggerated, serves to point the part irrigation played in growing much of our present beauty and prosperity. It reads in part: "Trees will not live in the house-yards, house owners can have no turf, no flówers, no fruits, no vegetables—the space around dwellings in the towns is a bare sand relieved by infrequent mosses and weeds. The grass is gray upon the plains; cottonwood and sappy pine are almost alone the trees of the mountain region; no hardwood is to be found anywhere; and but for the occasional oases by the streams, and the rich flowers that will spring up on the high mountain morasses, the country would seem to the traveler nearly barren of vegetable life."

There are a number of stories of the beginnings of wheat farming in Colorado, most of which give the credit to Mr. Byers. But his own account simply says that "it is remembered by the author and other



Old Home of William N. Byers, Taken in 1862.

Photo Courtesy of Denver Public Library.

settlers of that day, that two or three heads of wheat were discovered in a lot on Larimer street, near 15th in Denver. The seed had been dropped from an emigrant wagon in the summer and were thus late maturing. The

heads were of splendid form, the grain of unusual size and fine appearance. This circumstance at once gave the suggestion and the start to wheat planting."

There is as yet no complete biogra-

phy of Mr. Byers; but, from an idea of what he personally was like, a sketch by Albert B. Sanford, of the State Historical Society tells us that he was "a man with a most kindly eye, a frame strongly knit, sandy hair and beard. Always affable, easily approached, ever ready for a gracious word and a helping hand to friends."

He lived in several homes about the city, in his years here, and around all of them he lovingly planted trees, shrubs and flowers. An article in *Trail and Timberline* for June 1931, called "In Quest of the Unusual Among Denver's Trees", describes those around his last home on South Washington street, which was torn down to make room for the Byers Junior High School, though the trees, of course, have been carefully kept and tended. Mr. Pesman writes:

"Is the American Chestnut hardy in Colorado? Well, there is a full grown specimen on the Byers Junior High School Ground. . . The bur oak there is as beautiful a specimen as I know. Here we have a wealth of trees not found in any other small ground in Denver. We should notice a very large hackberry directly south of the building. A full grown Kentucky coffee farther south, the black walnuts on Pearl street, the linden, Norway, and sugar maple (side by side) and plane trees (or sycamore) on Washington street. . . a small horse chestnut north of the old residence planted in 1897. . . It is now gorgeous when in bloom and bearing fruit each year. White birch, cut-leaf, soft maple, apricot, hawthorn, mulberry—Mr. Byers succeeded in growing them all."

One of Mr. Byers' friends, Florence Burton, wrote: "In Denver's City Park stands a line of noble trees, the first and largest there, which were planted by Mr. Byers with an eye to the future. Leafy monuments to

his memory, were there no other." Attempts to find out exactly which ones they were have been unavailing. But another of his friends remembers, as a little girl in the old Broadway school, being taken in a bus to City Park with other children to plant trees on a long-ago Arbor Day. The holes were all dug and the trees waiting to be planted, on the road beginning at the 18th Avenue entrance and winding in front of the green house. So, for lack of evidence to the contrary, why not accept these, as the first trees planted in City Park?

Under the heading "Local Brevities" in the early paper, Mr. Byers and his staff kept track of important small things, as follows:

"Some of the trees and gardens along Broadway and the adjoining streets are being badly mutilated by vagrant cows, whose proper place is either in their owner's stables or in the public pound."

And he follows a note of the bending of a local orchard under a load of fruit with the observation, "Let the croakers who aver that fruit can't be grown here, make a note of the above."

Another time he reminds his readers that "maples and box elders are said to be the best species of shade trees to set out. Citizens should bear this in mind."

And, if he were alive today, I am sure at this very time he might be in the process of writing an editorial for his Sunday edition, urging "that it is the duty of every man who has the welfare of his state at heart to contribute his mite to the success of" the movement to secure an arboretum for his favorite city.

OLIVE HENSLEY.

A series of double salts of nicotine gives promise of being more stable and hence more effective as insecticides, than the simpler nicotine salts which have long been used.

PLANT-LIFE AREAS IN COLORADO

In trying to supply information regarding plants and horticultural practices for Colorado, we have realized the great difficulty in putting out any lists or rules which will apply equally to all sections of the state.

In Colorado we have probably more variation in climate than any other state. We have plains or almost desert areas; high mountain areas; rich, irrigated valley areas; and foothill and mesa areas. We have a great variation in altitude and rainfall; in character of soils; in length of growing seasons; and in protection and exposure. Then latitude makes for further variation in each of these north and south strips. We know that only certain plants will grow in the San Luis Valley, and that others are peculiar to the country around Sterling. To enable us to be of most help to all the varying areas in the state, we felt the need of a more definite method of referring to these different regions.

The accompanying map is a preliminary effort to divide the state into plant-life areas. In defining the boundaries of these areas, we have considered the following factors: altitude, rainfall, irrigation, latitude, length of growing season, soil and protection. We have combined the information found on existing maps, and checked with all available authorities. We fully realize that there will be many exceptions to any divisions that we can make, but we will attempt to outline areas where *average* conditions are similar. Where small areas have conditions better or worse than the average of the area, they can make suitable adjustments. Naturally, we have made closer distinctions in regions of larger population and have lumped together some regions of small population. While all sections of the state are important, there will be many times the calls for information in places like El Paso county

than in places like Cheyenne or Dolores counties.

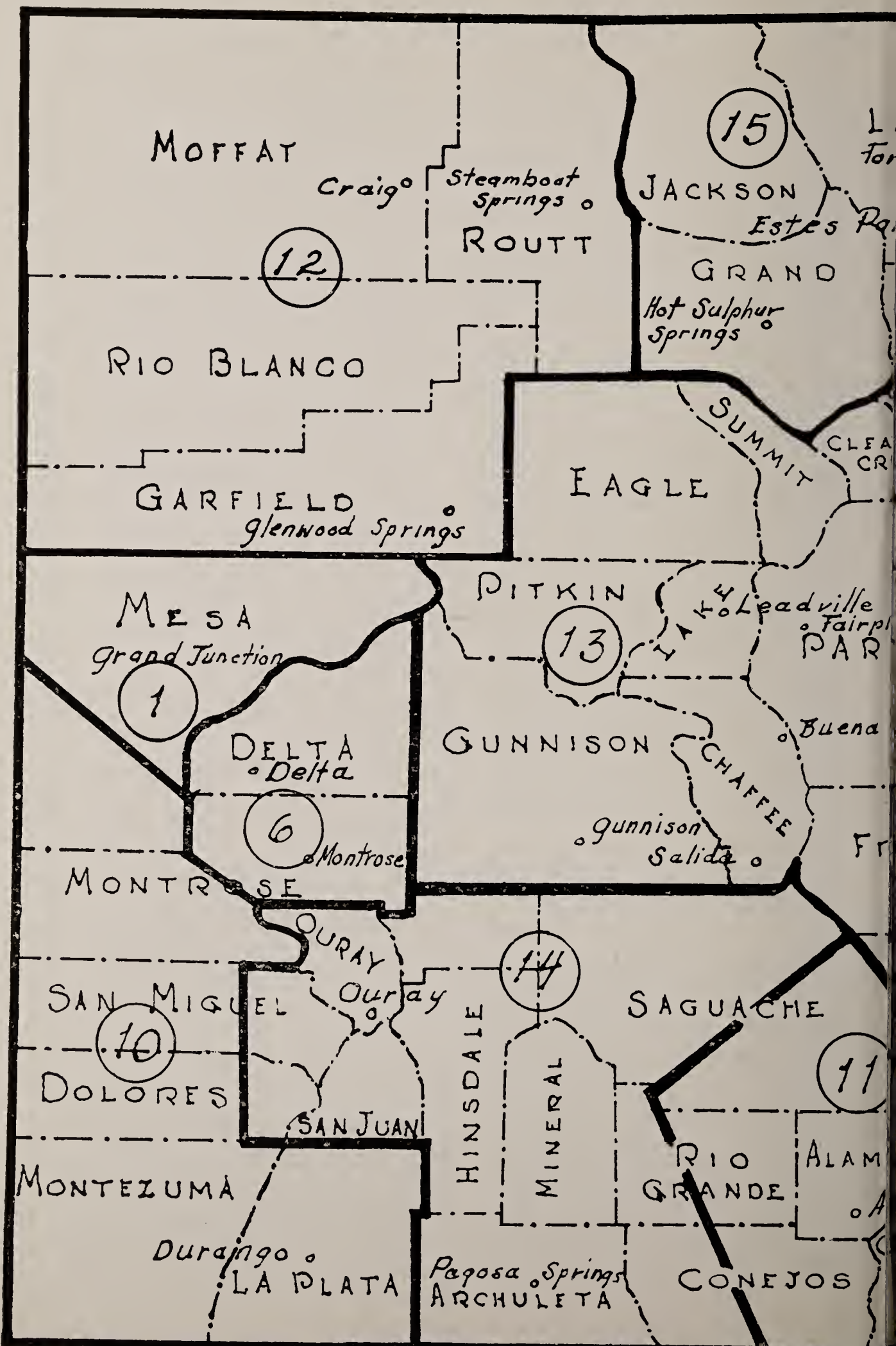
It is our plan to publish lists, from time to time as material is collected, of recommended plants for each area. We might start with suitable shade trees, and follow with evergreens, shrubs, hedge plants and perennials. Most of these lists will be arranged in two parts: Plants which may be expected to do well under average conditions, and those which *might* grow under exceptionally favorable conditions.

This objective may seem to be an endless and hopeless task, but if we can do even a little toward helping residents to become acquainted with more and better plants, it will be worth the effort.

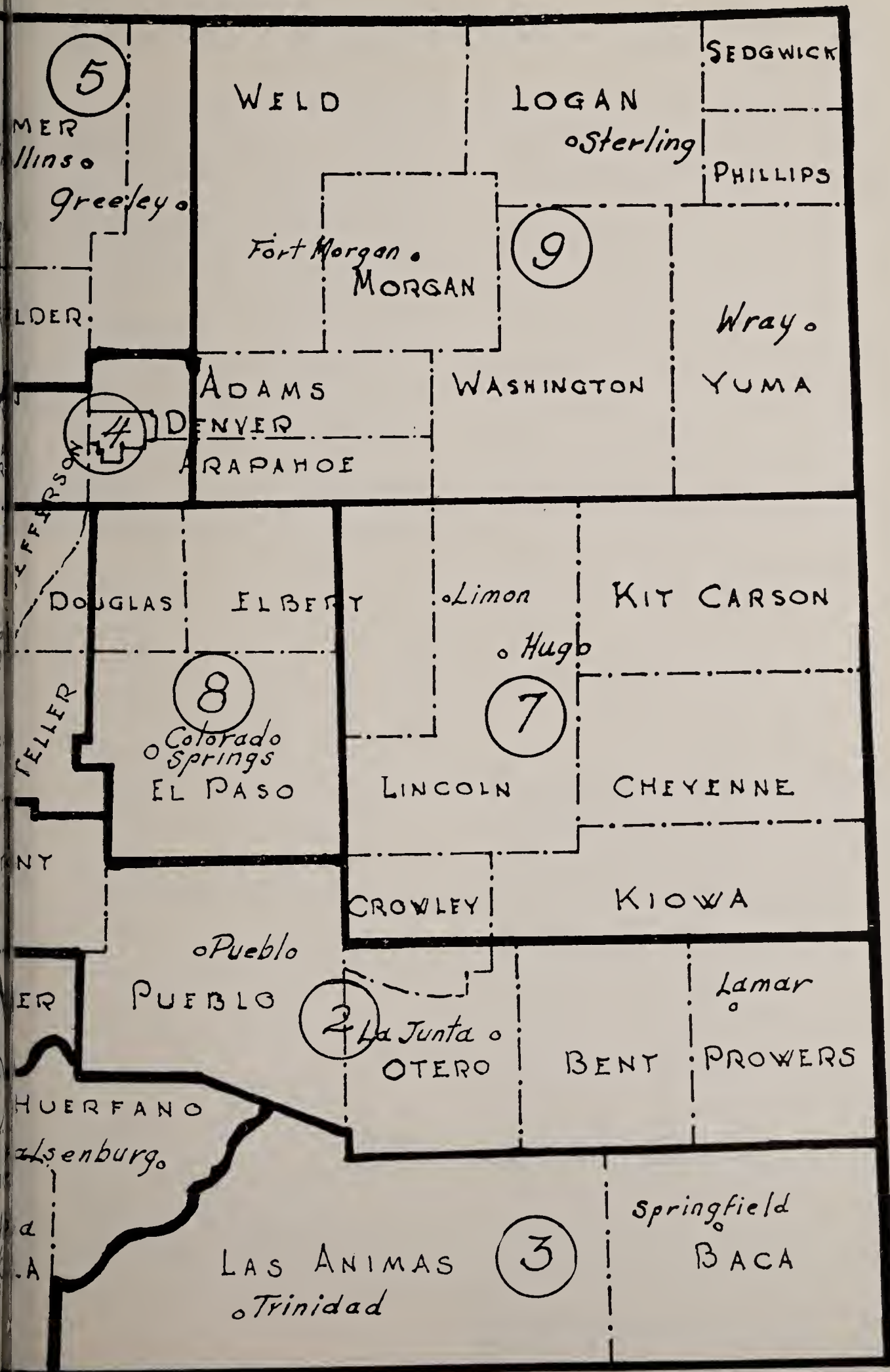
We will need the cooperation of EVERY member who is acquainted with growing conditions in even one area of the state. We will especially need the assistance of residents in counties distant from Denver. If you know the country around Julesburg, Craig, Durango, Springfield or Fairplay, will you please let us know of your willingness to cooperate in checking lists of approved plants? And please give us suggestions as to improvements in the boundaries of these suggested areas right away. Could some be combined or others further divided? We have tried to simplify the descriptions of areas by following county lines wherever possible, but we would welcome suggestions regarding improvements in these division lines.

The numbering of zones corresponds roughly to the length of growing season. Starting with Grand Junction, No. 1 is where there may be as many as 233 days between frosts, and ending with the northern mountainous No. 15, where there may be as few as two days between frosts.

GEORGE W. KELLY.



ANT ZONES



CULTURE OF ALPINE PLANTS UNDER LOWLAND CONDITIONS

By HELEN K. FOWLER, Shadow Valley Gardens.

HOW ENVIRONMENT CAN BE CHANGED TO GROW PLANTS REQUIRING ACID SOILS.

Many gardeners all over the world dream of growing the evanescent Mayflower but few reach its accomplishment. For centuries the docile species of plants—the civilized Peony, the Phlox, the Hollyhock, the Iris have yielded to man's dominion. Success with this group as with Roses and water plants often make him long to venture further, to try those rare kinds that prefer acid soils—the Painted Trillium, the trailing Arbutus and the lily-like bear tongue. I am not sure these plants prefer an acid soil; they may not even like it, nevertheless they are compelled to live in it.

Have you a space in your garden, not too dominant, with just a suggestion of informality and a background, perhaps of delicate spring foliage,—a place where you can bring to flower a few of these woodland treasures? Several years ago in my own garden a 10 x 15 ft. plot was devoted to growing the Arbutus, the Bunchberry, the Foam Flower and the Moccasin Flower. Later were added the Mayapple, Partridgeberry, Spring Beauty and Dicentra cucullaria, which, to be seen, explains its common English title. This need not be a complete ecological* grouping but one reasonably correct as to plant relationship. In such a bed you may dig in oakleaf mold or soil from beneath the Pines or you may remove existing soil to a depth of 18" to 2' and fill in with soil of definite acid reaction or you may change the soil at hand by adding quantities of peat and sand or again you may sprinkle the bed surface with aluminum sulphate, one-half pound to the square yard for very light soil, more for loam and most for clay.* While aluminum sulphate is usually used, after a

number of years, it is likely to increase the aluminum content, with possible harmful results; sulphur is used sometimes but that is also apt to form sulphuric acid which, even in small quantities is often injurious to plants. Tannic acid, which is found in plants and soils themselves, is preferred by many to any other chemical: a solution of 1 part to 50 of water is recommended. This bed should then stand for two weeks for thoro assimilation of the acid.

The really desirable native plants demand at least approximately the conditions of soil, moisture and light to which they are accustomed. Just because a plant must have acid does not mean it will do well in the sun if it requires shade nor will it live in dry soil if it likes moisture. The Native Columbine (*Aquilegia canadensis*) and the Philadelphia Lily, now known to demand intense acid must also be given dense shade.*

One of the difficulties in growing any alpine plant in the lowland is the great difference in the length of the growing season compared to what it experiences growing in the wild. Here, in Denver, between the last spring frost and the first frost of autumn or from about May 1st to the end of the first week in October, sometimes even a month later, we have from 150 to 180 days with half that time where plants grow wild.

Shall the Soil Be Rich or Poor?

A very lean soil has been found necessary for the alpine plants' best growth. Dr. Regal, way back in the 1800s' made this observation in a paper written on the Swiss flora; his theory was that poor soils slow up the rate of growth, causing them to

*" See notes at end of article.



WOOD LILY

includes the whole range of soils in which any plant can grow. pH7 is neutral, below is acid and above is alkaline. pH6 and pH7 do not bother the gardener because between them are included all normal garden soils for growing our common trees, shrubs and perennial plants. pH4 and pH5 are our chief concern here. They are of such significance that a list of cultivated plants is of record; for instance, the Pink Ladyslipper, trailing Arbutus, Calla palustris, Pitcher Plant and Clintonia borealis belong to pH4. In pH5 we find the Calla Lily, several species of Trillium and the Rocky Mountain Columbine—yes, our state flower must have acid. Scores of others are found in both lists. After some experience the gardener will find that he will recognize the requirements of each without any analyzing equipment, but at first it is the wise thing to know what the soil had in the wild and then try to duplicate it in the garden.

maintain their characteristic compactness which is their chief charm, and also the damping-off may result from a lush growth and later winter cold may kill them. While the ground must not be rich it must be open enough for excess water to drain off so that plants do not suffer from drought.

The Acid Test

How shall I know when there is enough acid in the soil to grow these plants? It will help any gardener to know how to make a simple, rapid test of the soil to determine the pH concentration. Here we have that terrifying symbol pH, which is nothing more than a sign to denote the proportion of acid or alkaline. There are soil-testing outfits still to be gotten at any of the seed houses and at the Denver Fireclay Company; with exact directions for using. The scale of measurement should not seem too difficult; it is really easier to do the testing than to talk about it. This scale* runs from pH4 to pH9, which

YELLOW LADY SLIPPER



Maintaining Soil Acidity

It is one thing to build an acid bed and quite another to hold it. Materials from adjacent ground seem to want to creep in so it is well to build the new bed higher than the surrounding area; then too the water for irrigating is inclined to be alkaline, that from ditches supplying irrigation extremely so. We have two kinds of water serving the city of Denver. Mr. George J. Turre just now gave me today's (Feb. 6) test-reading: the Moffat water has a pH of 7.75 and the South Platte a pH of 7.4. You may see from the scale how the water from the hose may change the pH. When little water is used for a very small bed, the worry isn't so great. Of course aluminum sulphate or tannic acid water may be made from the city water.

Winter Protection

If we happen to have snow all winter, which we rarely do, our plants are protected; but here in Colorado we have alternate thawing and freezing so we must use covering—first to maintain an equable temperature within the soil: this covering should be put on after the first hard frost in order to keep the ground frozen: second, to prevent too early a spring growth and last to shade the plants from the burning winter sun.

A Plant For Alkaline Soil

Some few plants like either acid or alkaline and will live where there is neither but there is one of the loveliest of autumn flowers that will grow in but one kind of soil, the Japanese Anemone. We move it all around our garden, trying it in acid and neutral soils but it must have alkaline for its best; and, remember it does as well in sun as in shade here in Colorado.

Other Woodland Plants

There are many woodland plants for formal or informal planting that will thrive in any garden where there

is good drainage and lots of humus*—the Virginia Bluebell (*Mertensia virginica*) and the blue Phlox (*P. divaricata*) should never be omitted from the May garden; *Hepatica* (*H. actiuloba*) and the shooting star (*Dodocatheon meadia*) come even earlier; Bloodroot likes a place all to itself in the shade where it can colonize; are we forgetting the Elder Daisy—the Ox-eye—of times forgotten? See it in the Jan Van Houten and the Eric Douglas gardens with the blue and darker Iris, and Mrs. Perry Poppy, for the combination of white, lavender, purple and salmon pink we all so admire: in spite of the widespread of its arching branches, the Bleedingheart does not seem out of place even in a small garden,—it flowers with the late Narcissus and the Darwin Tulips and should be used as an accent plant in the flowering scheme. When, late in the season, the tops begin to die down, Chrysanthemums may be planted to fill out the vacancy left by the disappearing foliage.

Anchusa myosotidiflora, the Russian forget-me-not, runs a risk of forfeiting the honors it won in spring by indulging in a "cabbagy" summer leafage: this is surely only a matter of planting. Near the lungwort, the *Pulmonaria*, the two running in adjacent groups can be very striking. The Primulas are always associated with the beauty of an English spring. They will continue to bloom year after year in a rich woodland soil.

Fall Crocus and Colchicum

Why do we not have the fall Crocuses and Colchicums splashed all over the garden as we do Tulips in the spring? "How", they tell me, "is it possible to get the Crocus' feeling" when leaves are drifting and when the only proper garden adornment is fertilizer and the wheelbarrow?" To be sure, they are as much a part of October as Daffodils are of March.



MARSH MARIGOLD

No, Alpine and woodland plants are not all easy. We still have some way to go before we can indulge in anything like conclusive ideas of their treatment in our garden. I once knew an old gardener, who so cherished the problems which every hour his plants presented him, that he would often go out of his way to avoid any results of research which promised to steal from him the mystery he loved.

H. K. F.

NOTES—Indicated in the script by “*”.
 Roses like a heavy soil, little on the acid side.
Ecology—The study of plants in relation to their environment.
 To make pH5, aluminum sulphate is used at the rate of —
 On sandy soils: ½ pound to the sq. yd.
 On loam: 1 pound to the sq. yd.
 On clay soils: 3½ pounds to the sq. yd.
 To make very acid (pH4) double the amounts in the above table.

The American Native Lilies, canadense, supurbum, pardalinum and humboldt seem to prefer acid soil.

(Notes continued on next page)



GLOBE FLOWER

pH value	4	5.0	6.0	7.0
	very acid	acid	slightly acid	neutral
				<i>neither acid nor alkaline</i>
	8.0		9.0	
	alkaline		strongly alkaline	

Humus—Decayed vegetable matter dug into the soil to open it up and supply sponges that will hold moisture.

Do not water too much. This is done all over Denver. Air is most essential to root growth. If a soil is made soggy by too much water there is no room left for air.

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PLANT LIFE FROM MANY ANGLES

Here is a new feature. Let us know if you like it. E. H. Brunquist has volunteered to help us assemble material for it each issue. It will contain all kinds of interesting notes about plant life, but particularly those items which apply especially to Colorado conditions.

Horticulturists usually either start out with an itching mind concerning plant life in general, or they soon become "infected" by way of their close association with plants. Every garden plant descends from wild plants, and has interesting relatives, both close and distant. There is also the kinship with the "lower" plants, the bacteria, algae, fungi and the like, with tenuous and devious threads of relationship stretching back through ages whose number can only be guessed.

Following achievement of a feeling for relationships, there soon comes the realization that plant life in general is not static, but something that is happening, something that is in the process of becoming, with goals that even the gods may not envision. Even aside from growth, a living plant is a congeries of processes concerned with the maintenance of gross and microscopic organization; it is something composed of a succession of *events*.

What we see in a garden plant is mostly supporting ('skeletal') material. Within this, however, is liable, unresting protoplasm, the dwelling place of that which is the difference between the living and the dead;

dynamic, and remaining alive only as the result of constant expenditure of energy. E. H. BRUNQUIST.

A MIRACLE INSECTICIDE

After the war DDT will become available for civilian use. It is apt to change our entire method of insect control. The army uses DDT successfully as a delousing chemical, a very low concentration being effective for a long period. Recently an entire island was sprayed with DDT by a torpedo bomber, which killed every insect on the beachheads and in swamps, as the invisible mist of the DDT solution settled. Only two quarts of the solution are estimated to be necessary per acre.

New miracles effected by DDT are reported as time goes on. It may develop into an all-around insecticide. The latest report comes from the American Phytopathological Society meeting in Cincinnati, showing its effect on potato leaf hopper, with great success.

Even frogs and fish can be killed by DDT. It is little toxic to mammals, except in high concentration.

M. WALTER PESMAN.

Of Mice and Worms and Quercus

JOHN STOCKBRIDGE

A while back, Quercus was out to our house for tea (he wanted to see my wild roses) and I am informed that after he got home he sat down and wrote something for "The Green Thumb" about my "Reeking Compost Pile."

Quercus, that wasn't my compost pile you smelt! It was a mouse that had gotten into the kitchen—or almost into the kitchen—and, being unable to make the last inch into the land of plenty and unable to find its way back to whence it came, had perished miserably. We didn't perish but we were miserable until the mouse dried up. Tried Lysol and Gentlemen's Christmas Cologne and everything else that we thought outsmelled the mouse and finally decided we liked the mouse best. Quercus was there in the pre-Lysol era.

Quercus, I want you to know that we speak of "my compost pile" in the plural and that it, or they, does not or do not "reek". To get a good reek, I add Adco, but I haven't used any lately because Nature is doing a slow but excellent job with all six (not one, but six—or seven if you count the leafmold) of my compost piles, and I wish Nature would treat a dead mouse the same way.

But be that as it may, our subject tonight is earthworms and what they can do for you—or your garden. We have already discussed in these pages the tenets of the Organic Gardening Cult, which believes it is less criminal to kill your uncle than to kill an earthworm and thinks chemicals are poisoning the human race and bases its hopes for the survival of mankind on making compost piles a certain way and has some mysterious secret formula for deciding when sulphur and phosphorus stop being minerals and become chemicals. Anyway, these

people think earthworms are our salvation.

Up to this point, we have depended on the Organic Gardening people to pin their faith in earthworms and on Quercus to mock them. Now comes new evidence.

That staid and earnest family guide, The Farm Journal, which falls for no fads and is earnest in purpose in spite of the rather irreverent view it takes of the OPA, has practically itself come out in favor of earthworms. It has found a man in Connecticut who apparently never heard of Organic Gardening but, equally apparently, has figured out a great deal about earthworms. He is a retired insurance man (from Hartford of course) who now farms a couple hundred bushels of corn to the acre and is convinced that he does it because he allows, and even encourages, 150,000 earthworms to browse on his acre of land. He has studied the earthworm casts. He doesn't know what happens in the worm's gizzard, but he does know now, in company with many others, that you find just plain dirt where the worm is going and you find nitrogen, phosphorus and potash where the worm was.

So what does this ex-insurance man do? I'll tell you what he does (and I hope Organic Gardening is not listening in for it knocks their and my compost-pile fetish into a cocked hat). He just lets his trash—any kind of trash so long as it's vegetable matter—lie on the ground and after the winter has worked on it he goes out and he harrows and harrows and harrows—just with a spring tooth harrow, first set at an inch, then at two inches, then at three and after a while with a disk. Then he grows things.

This handling of trash gives the earthworms something to eat and Quercus something to think about.

ORIENTAL FRUIT MOTH FOUND IN COLORADO

By F. HERBERT GATES, State Entomologist

The Oriental fruit moth, an insect that attacks such fruit as almond, apples, apricots, cherries, nectarine, peaches, pears, plums and quince, was introduced into the United States, possibly in ornamental trees from Japan about 1914. From this introduction, the first infestation was found in the District of Columbia. Since then the insect has become established in every state east of the Mississippi River with the exception of Wisconsin, Maine and Vermont.

In the fall of 1942, California reported an infestation of Oriental fruit moth in Orange County. Immediately following the report of this discovery, California set in motion the operation of quarantines. An appeal was made by the fruit industry of California to the General Assembly for funds for investigations and research and to maintain the proper regulations for the control and possible eradication of the insect. Surveys were started at once to determine the areas of infestation, first including only the counties in Southern California. As the surveys progressed, new infestations were found and recorded. At the present time Sutter County, the "peach bowl of California", has been found infested.

In the progress of the survey of the Federal Bureau of Entomology and Plant Quarantine, three different groups of inspectors were sent to Colorado for fruit and field inspections. These crews approached the commercial fruit areas by the way of backyard trees from the south, east and west, surveying and inspecting all backyard trees on farms and in cities. These crews entered from New Mexico, Utah and Nebraska, converging upon the commercial peach orchards of Mesa County.

In 1943 no infestation was found in Colorado. However, in 1944

survey crews discovered moths in traps in Prowers County. This infestation is the direct result of transportation of fruit from Kansas. Upon arrival in Lamar, this fruit was found to be "wormy" and was thrown in the ash can by the owner. The adult moths emerged from this fruit to cause local infestation.

Following the discovery in Prowers County, the moth was caught in traps near the fruit dump in a wholesale fruit market in Denver. In August, traps in the railroad section of Grand Junction, Mesa County, picked up a few moths.

It is conspicuous that in all inception of the moths in traps, the traps were in the vicinity of railroad yards or fruit dumps and *NOT* in commercial orchards. This is in accord with discoveries of all past infestations in other states.

Upon finding the moths in Colorado, plans were started by the Bureau of Plant and Insect Control in co-operation with the fruit industry for the establishment and maintenance of an insectary in Mesa County. Here parasites will be produced for the control and possible eradication of the Oriental fruit moth.

The insectary will raise hundreds of thousands of parasites to be liberated in areas where the moth was discovered. The areas of suspected infestation will be flooded with wave after wave of parasites throughout the growing season.

The insect passes the winter as full grown larvae in cocoons. Early in the spring, the larvae changes to pupae. The adults emerge about the time the peaches are in full bloom. This emergence period may last for as long as 8 to 10 weeks. This condition makes possible adults from the first, second and third broods at the same time.

There are four stages in life cycle: the egg, larvae, pupa and adult. The egg is grayish white and measures about $1/35$ " across. It is laid mostly on the under side of the leaves near the terminal ends of growing twigs on peach trees, and on the upper surface of leaves of apple and quince trees. Incubation period is from 3 to 40 days, depending upon the temperature.

The larva is from white to dirty pink and measures about $1/3$ " to $1/2$ " long. During the summer the larval stage is from 6 to 15 days, while in the fall it is much longer.

When the worm is matured and ready for pupation, it eats its way out of the fruit and either drops to the ground by means of a silken thread or crawls down the tree and spins a cocoon. The cocoon may be found under objects on the ground, or some part of the tree, or in other places than the host plant. In the cocoon there is a prepupal stage which may last 3 - 5 days, thereby making the prepupal and pupal stage last about 15 days.

The adult moth is small and grayish-brown with a wing expanse of about $1/2$ ". It indulges in a very active, zig-zaggy flight at sundown. The female lays from 100 to 200 eggs for a period of 7 to 10 days, starting 2 days after emerging.

Upon hatching in the spring, the young larvae bore into the terminals of twigs and start feeding. This continues until the small fruit is formed. Then the larvae leave the twigs and enter and feed within the fruit. Each successive generation of the worm feeds within the fruit for the remainder of the season. If, however, there is no fruit crop, the worms continue to feed within the terminals of the twigs. Thus, whether we have fruit or not, the insect is propagated and does severe damage to the trees, causing them to have the appearance of having been horned-back, and the fruit wood is destroyed.

Control: The artificial control of the Oriental fruit moth has not been successful. Standard methods such as spraying with arsenicals have not been satisfactory in that the worm when entering the twig or the fruit ejects the first few bites and enters into the twig or the fruit before feeding is started.

Natural or biological control is the only hope at present. This consists of the development and liberation of thousands of parasites in infested areas.

DAMAGE TO FRUIT CROPS

In areas infested with Oriental fruit moth, damage to the fruit crops may be from 10% to as high as 85%, depending upon climatic conditions and the population of the worms. These periods of high and low infestation are unpredictable, which adds greatly to the seriousness of any infestation. Periods of low infestation may continue for several successive growing seasons when little damage is experienced. However; if during these periods, the infestation increases in intensity, the subsequent crops may be almost a total loss. The insect, if it becomes established in Colorado, has reason to be more serious than in other localities. This is due to the fact that fruit areas in Colorado produce most of the host plants covering the entire growing season. Starting with early apricots, the host fruits follow by cherries, early peaches, pears, late peaches, and apples affording a constant preferred host range.

If this insect should become established in the fruit areas of Colorado, it is quite possible that the added cost due to the loss of fruit and commodity treatments would be so heavy as to preclude the possibility of any profit to the fruit grower or the industry in general. The district infested, of necessity, would be forced to make provision for fumigation for much of the fruit sold. This fumigation would have to be done in the

car before icing. This would mean that a complete revision of the routine in the spotting of cars would have to be made which by reason of delayed movement would cause much confusion in routing shipments. The

Oriental fruit moth is, perhaps, one of the greatest threats not only to the fruit industry but to the economics of the State. There is no precaution that should be neglected.

WE WILL SHARE WITH YOU

The last few weeks have been most encouraging. Many new memberships have been coming in, and we now have a large enough number to show us that there is a real appreciation of the work we have tried to do. Still more encouraging to us personally has been the offers of services by experts in the writing of articles about the many phases of Colorado Forestry and Horticulture. These contributions are the thing that will make the Green Thumb worth while. But as the membership and the magazine grow there is a greater and greater number of things to be done to keep everything going right. This necessitates delegating more and more duties to others. We have found a great deal of enjoyment in working

to put the magazine on a sound basis. We are sure that many others would enjoy helping. We need, for instance, an art or photo editor, an editor for a rose column, and there are numerous little clerical duties that any one interested should enjoy doing. If you would like to help please let us know.

We have had a suggestion that we start a surplus swap column, from Carla Swan, who writes: "This way people like us who have thousands of iris every summer could find homes for the bulbs we might otherwise throw away. Also there might be things that others grow in too great abundance that we would like very much to have." If any are interested, send us your lists.

TREES FOR EASTERN COLORADO

The editors appreciate very much having members write us their reactions about articles in the Green Thumb. We can only guess how well we are satisfying the readers unless they let us know.

We have had many fine comments about Jules Renaud's article "Sanctuaries in the plains", but have received one letter where the writer suggests some improvements. Mrs. D. M. Andrews of Boulder, Colo., writes as follows: "One thing that I want to comment on is the article by Jules S. Renaud, 'Sanctuaries in the Plains'. The windbreak trees he mentions are good, I think, with a little exception. Why anyone recommends Chinese Elm, I don't quite know. They get broken in storms worse than any other tree. (They do recover soon,

however). But, one of the best trees was not mentioned, the Thornless Honey Locust. Mr. Andrews always considered it the very best for this country. Why anyone would recommend the black locust is beyond me. If ever anyone wants to get rid of them they can't, until they get borers and then they go fast enough." Coming from Mrs. Andrews these are suggestions worth noting.

In case you thought this a local affair, let me say that The Green Thumb is subscribed to by people in 35 towns in Colorado. Fort Collins leads after Denver, with Boulder, Colorado Springs, Grand Junction, Gunnison and Alamosa close behind. Furthermore, the magazine is sent to people in 17 other states, and one other country—England.

become as large as other cherry trees. Osthien cherry is a midseason, medium to large, blackish type, and has a mild, rich, sweet sub-acid flavor. Pitted cherries with a top coating of sugar are a "must" for the home freezing unit.

PLUMS: These fall into two main groups for Colorado planting; viz., American and European types; some European and Japanese plums shipped from the Pacific coast are not hardy here. American types comprise a big family of native and native-hybrid varieties with varying distinction in size, flavor, and freedom of pit from the flesh. At random we note several varieties of budded plums, such as Kahinta and Superior, both quite large—also Underwood, Monitor, Golden Rod, Omaha, Waneta, Golden West, Dropmore, and Sunset. The last three are exceptionally hardy. The European types include the Prunes, Damsons, in addition to some mild, deliciously flavored varieties of which Green Gage and Lombard are most commonly planted in Colorado. As a class the European plums are slightly less hardy than are the American. Cherry-plum hybrids are a man-made group of fruit trees for the cold Northern Great Plains, and there are substitutes for cherries. Familiar names are Compass, Opata, Sapa, Tom Thumb, and Zumbra, which are a result of crossing the native Sand Cherry, a bush fruit, with hardy native plum trees. In size these are like very large dark cherries and carry considerable resemblance to the Sand Cherry in flavor. They have ample hardiness.

The limitation of Peaches, Apricots, and Sweet Cherries on the Eastern Slope is paced by unpredictable cold waves that start in the arctic regions, sweeping down over the plains east of the Rockies, and low relative humidity. Even in complete dormancy, a jarring ten to twenty below zero usually takes the fruit buds, and at twenty to thirty-five below zero, the tree itself can be severely injured or killed outright. There is some distinction in hardiness among peach varieties, but the tenderness of the species so far does not give assurance of sustained dependability. In any event, it would be well to plant the hardiest variety that the nurseryman has to offer. Considerable hardiness in Apricots exists within the Siberian strains and we await the day when hybridizers add more quality and later blooming habit. When that is accomplished, another hardy tree fruit will be permanently welcome and useful. The varieties, Scout, and those in Dr. Hansen's group, are the farthest advanced to date among the hardy apricots. Except in rare cases, the luscious sweet cherries, Bing, Black Tatarian, Royal Anne, and others, are disappointing in hardiness. It is suggested that first consideration among sweet cherries be given to Yellow Glass, and Windsor, a dark variety. The former has some scattered bearing trees to its credit from Ft. Collins southward. Pears perhaps have justification of more planting than is currently the case, especially with blight resistant varieties. Old time standard varieties are mildly represented; however, future planting would likely benefit from the hardier pear varieties originated in the north, such as Mendel, Parker, Patten, and the Canadian variety, Tait.

Among plums, pears, and sweet cherries, a number of varieties are not self pollinating, and should be planted with another variety of the same species for optimum setting of fruit.

SMALL FRUIT: These fit into any size home fruit plan. Hardest are Gooseberries and Currants. Among the better known Gooseberries are the varieties, Champion, Downing, Josselyn, Pixwell, Carrie, and Poorman, which are of American origin. The giant size English varieties suffer in our soils and climate. Currants are diversified as to color of fruit, occurring as black, white, and the popular reds. Varieties of red currants of earlier years seem to be receding in favor of two fine improved varieties, Perfection, and Red Lake. Widely cultivated in the Northern Plains, the Bush Cherry, representing selected fruiting strain of *Prunus besseyi*, is extremely liberal with white blooms in the spring, and in late summer, the branches are crowded with dark, medium size cherry like fruit. *Prunus tomentosum* (Nanking Cherry) has a very pleasant surprise with its juicy cherry-like red fruit during seasons without damaging late spring frost. Cane fruits, such as raspberry delight in Colorado climate, with irrigation, but volume of fruit is proportionate with the protection the young canes have from drying out over winter. Truly successful in tending the one-season kinds, is the practice of covering the canes with dirt after laying them over parallel with the ground in the fall. Everbearing raspberries extend the fruiting season until frost through terminal fruit clusters on the young shoots of the current season's growth; however, the main July crop is lost if the one year canes have not survived the winter. Latham, Marlboro, Chief, Cuthbert, and Newburg are red one-season varieties most grown; results with the large fruiting Newburg have been most encouraging. Red everbearing sorts are the long standard St. Regis, and more recently we have the larger sized Indian Summer. Black raspberries, slightly harder than the reds, are most generally represented by the variety Cumberland. Sodus has merit as a purple fruited kind. The interest formerly bestowed on Dewberries, and later Youngberries, is now justifiably focused on the big luscious Boysenberry, the thornless strain naturally being preferred. The gardener who grows Boysenberries should determine at an early date if his location requires protective covering over winter for the vines.

Grapes have a fluctuating line of resistance to climate in Eastern Colorado, especially in the

northern section and in the open plains. Concord is the best known blue grape; Fredonia is a counterpart except that it is two weeks earlier than Concord. Diamond is a fine sweet white grape as are Niagara and Portland; Caco is a good red. Such varieties may be planted with fair confidence in city and suburban gardens, since the environment of buildings and trees will lend a desirable protective influence. Skirting the foothills, one finds an occasional vineyard of commercial size. In case of doubt as to hardiness, the Beta grape, also Alpha, will boldly drape any fence or arbor and defy winter killing. Beta is a cross between the hardy wild grape and Concord, and is a medium of size and flavor between the parents.

Good garden soil and irrigation at the proper times will yield an abundance of home grown strawberries. Since the majority of home gardeners grow everbearing varieties, the long list of June bearing kinds would perhaps be of more interest to the commercial grower. The Gem has acquired the best all around record of the everbearing strawberries; hardiness is a primary virtue, but quality, size and flavor are also satisfactory. Mastodon will exceed Gem in size and is milder in flavor, but is not quite as tenacious. Just this year plant stock is available of two strawberry originations of the Cheyenne Horticultural Field Station, which probably are the hardiest in cultivation. These are called Early Cheyenne 1, and Cheyenne 2; they are June bearers of medium size fruit that have excellent flavor and aroma. Parentage is the native Rocky Mountain strawberry crossed with commercial varieties. These can be best appreciated where other strawberries will not thrive, such as at the mountain cabin or ranch, or they might even be naturalized at the back of the garden. A third variety has also been released for propagation.

Since they are parallel with fruits in their perennial nature, it would not seem out of place to mention the very hardy and easily grown asparagus, rhubarb, and even horseradish. McDonald College of Quebec has taken the spotlight in glorifying the rhubarb. New varieties, McDonald, Ruby, Chipman Red, and Canada Red are fine improvements; their features are milder flavor and prominent red coloring of the stalks. Canada Red and Chipman Red have red color even through the center of the stalks.

Fruit for the home cannot only be valued in economic return, but also in health, landscape value and adding wholesome atmosphere to good American family life. No tree has as much character as the old apple tree in the yard whose presence is almost legendary to a generation or two who have barked their shins climbing up among its limbs.

FERTILIZERS AND INSECTICIDES SCARCE THIS YEAR

Officials of the W. P. B., W. F. A. and O. P. A. say that because of increased military demands for ammunition there will be a reduction in the fertilizer supply for 1945. They also indicate that supplies of pyrethrum, rotenone, nicotine sulphate and DDT will not ease after V-E day but will continue short until after the close of the wars.

* * *

The last "Readers' Digest" tells the story of a young ex-marine who has come home and tried to go back to high school. After his strenuous and efficient living in the South Pacific, the curriculum in the schools here seems very inappropriate to him. He asks why he and a few thousands like him can not have training in trades and businesses which they will want to follow. Among these he mentions landscaping. We should see to it that any service man returning to Colorado is able to take an efficient course in landscaping or associated work.

* * *

The Park Hill Garden Club of Denver, writes Mrs. Carl Cross, has made one of their objectives 100% membership in this organization. She says that Bob More, with his fine talk on Evergreens, inspired 16 of their club members to join. That 100% goal is a worthy objective for all the garden clubs in the state.

* * *

Mrs. G. R. Marriage, Colorado Springs nurseryman, writes: "Your Lilac Survey is a real achievement." Mrs. Marriage has accomplished a real achievement herself in her fine contributions to The Green Thumb.

* * *

Henry F. Lake, Jr., Gunnison editor, writes: "Your Lilac number is a work of art. It should be greatly appreciated by the garden lovers of the West." Mr. Lake himself grows 77 varieties of lilacs in the mountains above Gunnison.

* * *

Mrs. Helen Fowler, of Shadow Valley, deserves the orchid—or whatever gardeners consider the apex of flowerdom, for she has alone brought in over \$1,000 in sustaining memberships to the Association by her enthusiastic and tireless efforts.

THANK YOU!

The Green Thumb extends its sincere thanks to the following firms who have generously provided *extra* financial support to this magazine:

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Upton Gardens	Colorado Springs
Barteldes Seed Company	1521 15th St., Denver
The Colorado Seed Company	1515 Champa St., Denver
The Rocky Mountain Seed Company	1321 15th St., Denver
Simpson Seed and Floral Company	1525 Champa St., Denver
Western Seed Company	1425 15th St., Denver
Alpha Floral Company	420 16th St., Denver
The Blossom Shop	Brown Palace Hotel, Denver
Everette R. Brown	1225 Logan St., Denver
Denver Wholesale Florists Company	14th and California Sts., Denver
Flowers, Incorporated	718 17th St., Denver
Park-Elitch Company	1440 Wazee St., Denver
Park Floral Company (Wholesale)	Denver
Rockmont for Flowers	420 17th St., Denver
Lieb's Flower Shop	3922 W. 32nd Ave., Denver
Ruth Benson Florist	Wheatridge, Colo.
Eugene M. Ardelt	1754 Broadway, Denver
Landscape Service Company	1055 Josephine St., Denver

ANOTHER THANK YOU

We appreciate very much the offer of the Colorado Mountain Club to use any of their collection of cuts. All the cuts of flowers in this issue are borrowed from them.

PAGING THE GIANTS

Looking over the list of "Biggest Trees", in the January "American Forests" we note that only one "biggest tree" is located in Colorado: a blue Spruce in the Gunnison National Forest.

We plan to start at once a "biggest tree" contest in the state. Anyone

knowing of an extra large tree of any kind in the state, please let us know, giving its location, circumference at 4 1/2 feet, spread and height. We will feature first Cottonwood and American Elm. Let's find the largest trees of both kinds in Colorado and also in the Denver area.

SEASONAL SUGGESTIONS

March and April

While we may have some of our most disagreeable winter weather this month, still we will see signs between storms of the approach of Spring. We will have the promise of renewed life as we see the sprouts from fall bulbs poking their heads up, and later there will be the thrill of the first crocus and snowdrop.

Although it is hard to resist the call of Spring when the first warm day comes, remember that this is Colorado and go easy. We might have a Spring like last year again, when it was cold right up to the time it got permanently warm; but the chances are about ten to one that we will have several spells of winter before it is really safe to do Spring work. This is one important time when we should not believe all we read in horticultural literature. This "spring kill" is one of the peculiarities of Colorado climate that we must learn about. So don't go out and remove all the mulch from the roses on the first warm day of March.

One thing that we should remember to do, if it was not done last fall, is to spray with a dormant spray for any scale insect that we find; especially elm scale and oyster shell scale on lilac, dogwood, and cotoneaster. This dormant spray of miscible oil or lime-sulphur should also kill some eggs of other troublesome insects.

If it should warm up enough to thaw the soil and dry it out, you may work off some of that Spring fever by spading the garden. Spade under all the compost possible.

If you can spade the garden, it is time to plant sweet peas. Dig the soil deep where you want to plant them, and work in plenty of manure or other fertilizer.

Any time that the frost is out and the soil dry enough to work is time to transplant trees, shrubs and perennials. With the lack of help this year, nurserymen will have to start early to get half their work done.

You can begin to clean up the garden even before the frost is out. Do not remove all the protection around perennials and roses at the first warm spell and do not burn all the mulch removed. Leave all the fine material to decay further. Tall dead stalks and weeds can be removed anytime. The dead tops of Buddleia, desmodium, hibiscus and such can be cut off now, but remove the rest of the winter mulch gradually, between now and May.

If you plan to start some of your own vegetable plants, plan now for a hotbed, or boxes in the window.

Rhubarb and asparagus should be transplanted as soon as possible. Put a bottomless box or basket over a few plants of rhubarb so that you may have some to use a few days earlier than the rest.

Clumps of peonies can still be moved successfully if they are dug with a ball of dirt and moved carefully.

Don't let large masses of ice or snow remain on the lawn too long. It may smother out a spot. If your lawn was planted in the usual poor soil found around new houses, you will have to give it its annual "shot-in-the-arm" of fertilizer any time now.

Many annuals self-sow. Such plants may have their seeds sown very early. Some of these are larkspur, cornflower, cosmos, calendula, marigold, petunias, poppies, and portulacas. Most seeds of flowers and vegetables other than these mentioned should wait to be sown until the ground warms up in May. Try planting some gladiola bulbs early, and a few more each week thereafter. They should be planted quite deep—6 to 8 inches—for most bulbs are better planted a little deeper in Colorado than recommended for the East.

If you have any way to get to the foothills you may find some of the early wildflowers following a week of warm weather. Look on the warm south slopes for Pasque flowers, Oregon grape, early candytuft and Spring beauty. There is a thrill in finding these first flowers not exceeded by the thrill of the masses of color in June.

When some warm days come in April, it is worthwhile to risk a few seeds of the hardy vegetables. If they come up you are way ahead, and if not, nothing much is lost. Try radishes, lettuce, smooth peas, spinach, turnips, onions, carrots, beets, Swiss chard and parsnips.

Look for the early bloom on trees and shrubs. How many have seen the bloom of an elm and maple? They come after a few warm days in March or April. The Buffaloberry's tiny yellow blossoms come very early before you expect anything would have the nerve to open. The alder catkins will soon expand, and dwarf iris may peek through. Crocus and snowdrops will appear almost out of the snow in warm spots. The yellow bells of the forsythias, tiny white flowers of the early spireas, will be showing up. Flowering almonds, currants and plums will be coming and then everything comes in a rush.

The Green Thumb

VOLUME II

NUMBER 3



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1945

THE GREEN THUMB

A Bulletin of the
COLORADO FORESTRY AND HORTICULTURE ASSN.

Organized in 1884

George W. Kelly, Editor.

L. C. Shoemaker, Office Manager
Room 14, 1608 Broadway — Phone TAbor 4673
Hours: 11 to 2 — Monday, Wednesday and Friday

"To preserve the natural beauty of Colorado; to protect the forests; to encourage proper maintenance and additional planting of trees, shrubs and gardens; to make available correct information regarding forestry, horticultural practices and plants best suited to the climate; and to coordinate the knowledge and experience of foresters, horticulturists and gardeners for their mutual benefit."

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VICTORY GARDENS

"Shall we plant a Victory garden again this year?" "Is the need still as great?" "Is there an over-emphasis on Victory Gardens?" "Is there danger of interfering with commercial producers?" "Should we plant flowers and ornamentals this year instead of vegetables?"

These are some of the questions that we are being asked every day. We are not including a great deal about vegetable gardens in this issue. This is in keeping with our editorial policy of trying to supply those things which are not obtainable elsewhere. Last year, when the need for authentic Victory Garden information was great the Association printed 11,000 copies of a Victory Garden Manual written by Chas. M. Drage.

Personally we feel that where conditions of soil, water, time and situation are suitable everyone should hit the Victory Gardens harder than ever this year. When the urgent necessity is over we do not believe that there will be so many people continuing the raising of vegetables as to seriously effect the commercial grow-

ers. There will be those of course who will appreciate the extra quality of fresh vegetables enough to be willing to have them cost several times the price paid for vegetables raised on the large scale farms. Many other Victory gardeners will satisfy their new-found enthusiasm for working in the soil by changing over to flowers and ornamentals.

There is so much information available this year for gardeners that it seems unnecessary to offer similar material. Mr. Joseph A. Bixby, City Forester, has accumulated in his office at the City Hall a collection of 60,000 bulletins from various sources covering all phases of gardening. The Denver county agent, with offices at 513 Insurance Bldg., has bulletins and personal advice available for all Denver residents. The Colorado A. & M. college at Ft. Collins, has bulletins and experts for the benefit of all residents of the State. All the reliable seed companies are glad to give advice to gardeners.

Yes, we recommend that you plant a Victory Garden.

MORE ABOUT DDT

Our attention has just been called to an article and editorial in the March "Nature Magazine" about DDT. It warns us not to be too enthusiastic about a "world free from insects" because of DDT. DDT is still in the experimental stage, and we do not know all of its possibilities. We do know that it does not kill all kinds of insects, and that it does kill many beneficial insects. With the "balance of Nature" upset by killing off many predatory insects, many other "bugs" are allowed to develop to dangerous numbers. A "World free from insects" would be a world without a great many of our finest flowers and fruits. DDT is a wonderful and powerful drug, but as yet we had better let an experienced "doctor" prescribe it or it might do more harm than good.

* * *

In answer to the comments of Mrs. D. M. Andrews of Boulder, about windbreak trees, I would like to say a few words in defense of the recommendation of the planting of Chinese elm in Eastern Colorado windbreaks.

The Chinese elm grows too fast for its own good. It grows very rapidly for about ten years and then usually begins to deteriorate with the brittle branches being broken by wind and snow. But it is the rapid growth and better than average form that makes it a very valuable tree in the plains country of Eastern Colorado. Its remarkable growth, under adverse conditions, demonstrates to the farmer that trees will grow in his treeless country. Its growth convinces farmers on the plains that they can have a fine windbreak around their buildings. When Chinese elms are recommended every attempt is made to explain to the landowner that the trees are short lived and plans must be made to have slower growing trees such as green ash or hackberry, replace them in 10-15 years.

The thornless honey locust grows well on dry sites, but its rather thin crown reduces its value as a windbreak tree. Black locust has a valuable secondary value as a fence post material and for this reason is a good windbreak tree where borers will leave it alone.

JULES S. RENAUD, Associate Forester,
Soil Conservation Service, Littleton, Colo.

LILIES

By KATHLEEN MARRIAGE

Lilies and their culture have been so thoroughly and so interestingly covered by George Slate's book that there's little to say except as to varieties that have proved good in Colorado and a word as to culture.

Those we have found hardiest and most permanent are: Regal, Candidum (Madonna), tenuifolium (Coral Lily), Concolor, Formosum philipinense, philadelphicum, Mariposa, elegans, croceum, umbellatum, tigrinum.

L. Regal holds first place for staying on the job year after year as well as for beauty and fragrance.

Madonna Lilies, lovely as they are, would be more welcome if they could give up that silly habit of fall growth that can suffer acutely in alternate sun and cold.

L. tenuifolium is an airy, graceful thing, hardy as Pike's Peak, and



welcome. It looks best planted closely in groups.

L. concolor, another dainty little chap, bright scarlet, upturned and very hardy.

L. Formosum, an exquisite satiny flower which changes from pure white in youth to deep crimson in old age.

L. philadelphicum (montanum), a native, orange scarlet upturned flowers of delicate texture.

L. Calochortus, Mariposa Lily, the exquisite white-green-lavender lily of our aspen woods. Succeeds in the garden but plant twice as many bulbs as you hope to have flowers. Why? Do you know? I don't.

L. elegans	{	are rather similar, croceum the taller; both are big, strident, noisy
L. croceum		orange fellows valuable for planting in big perennial gardens.

L. umbellatum, a refined apricot-shaded edition of L. elegans.

L. tigrinum, the well known old tiger, useful since he comes later than most lilies.

L. Auratum, so lovely that it is worth growing even for one season. It seems to end there in our garden.

There's little to add about culture. If we remember that all lilies in their habits are found growing amongst other not too aggressive plants and

if we give them similarly near and suitable neighbors, as well as open peaty sandy loam at their roots, we'll probably have a succession of lilies all summer. Few of them appreciate full sunshine all day in Colorado. Dappled shade of birch or aspen—or half-day sun keeps them blooming longer.

Depth to plant is important but a b c, and x y z of this is in George Slate's valuable book "Lilies for American Gardens".

SPRAYERS AND DUSTERS FOR 1945

By EARL PHIPPS, of the Simpson Seed Co.

The curtailment of war materials has reduced the available supply of sprayers and dusters for the coming season. Many changes in materials have been introduced, the most notable being the substitution of plastic for parts which formerly consisted of metal.

Available for the small gardener are hand sprayers ranging from pint to quart sizes. There is also a very limited supply of pressure tank sprayers in sizes from 2½ to 4 gallons capacity.

In our opinion, the best sprayers for the small garden consist of the modern hose sprayers, which have proven very efficient and economical. These are equipped with a movable deflector which enables the spray to be directed up, down or sideways. The water from the garden hose picks up the proper amount of insecticide from the container, mixes it thoroughly, and forces it out through the nozzle in a medium fine spray which is ideal for the small garden. All modern liquid spray materials which are free from soap may be used in them. A new plastic Victory

sprayer consists of a transparent cartridge chamber, plastic spray cap and a removable leather washer-agitator. It has proven very satisfactory for the small garden. It is an efficient mixing and spraying device which is attached to the garden hose in place of the regular nozzle. Prepared cartridges of the appropriate insecticide are placed in the chamber and properly diluted and forced out by the pressure of water in the hose.

A few other types of sprayers are available.

The supply of dusters seems to be even more critical than that of sprayers. The stock is very limited, and will probably consist for the most part of small hand dusters of various sizes. However, most manufacturers are packing their various dusts in blower cans and sifter tops which eliminates the necessity of special dusters.

It seems appropriate to mention at this time that it now appears that there will be a adequate supply of insecticides and fungicides available for this season.

* * *

The Colorado Mountain Club invites our members to attend a lecture by Dr. H. G. Wilm, which they have arranged for in their regular winter series. Dr. Wilm is of the Rocky Mountain Forest and Range Experiment Station and well known to our members. He will talk on "The Forested Watershed and Your Water Supply." The date will be May 22, and the place probably Dennison Memorial Hall at the Colorado General Hospital. Call the secretary of either organization a few days before for the definite location.

THE BEST IN THE OLD AND THE NEW PHLOX

By ROY ROGERS, *Rockmont Nursery, Boulder, Colorado*

Phlox is our most valuable perennial. It is found in all well planned gardens and no other perennial will add as much color to your garden as will a good selection of phlox.

It is not difficult to grow but there are a few necessary requirements that must be supplied. It should have good soil, well filled with humus and the necessary minerals. It must be well watered as it is a shallow rooted plant and the foliage and flowers wilt quickly on hot drying days.

When making a selection of varieties, color is usually the primary consideration, but it takes more than color to make a good phlox. Ruggedness of growth and the ability to withstand heat and the attack of insects should be carefully studied. The size of the flower heads and the length of time they remain well filled with good flowers should be a major consideration.

As most gardeners admire the bright colors we will start our list with the reds.

LEO SCHLAGETER. Considered the finest of the reds. A brilliant scarlet with just a slight orange cast and a darker red eye. It grows to two and a half feet under good cultivation. Large flower heads, well filled with good sized flowers that do not fade quickly.

AFRICA. Another fine phlox with a carmine-red flower and a blood-red eye. A darker red than Schlageter. Large flower heads on short, stiff stems. A good red that pays big dividends for a minimum of care.

HUPMAN KOEHL. I like this phlox because it is easy to grow, for its stout, short stems and its large flower heads of rosy-red flowers. A choice phlox that should be near the front of all good borders.

COLORADO. A rich salmon-red with a vivid red eye. It has

short, stout stems and large flower heads. The color is unlike that of the other reds and when well grown it is truly a magnificent phlox.

B. COMTE. A rich, satiny, ox-blood red and the darkest of the reds. It comes into flower after most of the other phlox have passed their prime. It has good foliage and is free from disease and mildew. The wilted flowers remain on the plant but are not noticeable from a distance. No other phlox will make such a vivid splash of color over as long a time as will B. Comte.

CHARLES CURTIS. A new red from Wayside Gardens that is claimed to be the most brilliant phlox in cultivation. The color is given as sunset-red. I have not seen this phlox in flower and am including it in this list because I have heard it very highly praised.

DAILY SKETCH. One of the new pinks that is really fine. Extra large flowers of salmon-pink that shade darker toward the center so that the flower has a crimson eye. Very large heads on good stems.

ELIZABETH CAMPBELL. Considered by many to be the finest of the light salmon-pinks. It is not a good grower. Enchantress is almost identical in color and makes a much better plant.

E. I. FARRINGTON. This striking new phlox has large heads of salmon-pink flowers that shade darker near the center. A fine phlox that seems to have about everything a good phlox needs.

JULES SANDEAU. (Border Gem). One of the older kinds that is still fine. A dwarf phlox that grows to around eighteen inches. The large flowers are a bright rose or watermelon pink. The color is the same throughout the flower. A robust grower and a choice dwarf phlox.



Phlox Growing in Rockmont Nursery.

PAINTED LADY. A clear, delicate pink with large flowers and a large distinct red eye. Rather dwarf with good heads and an abundance of flowers.

COLUMBIA. This patented phlox was introduced by Wayside Gardens a number of years ago as the finest pink phlox in existence. Within a short time it found its way into many gardens. With us it has been a poor grower. Perhaps in the east where there is more humidity it may be a good phlox.

ROCKMONT PINK. A number of years ago this phlox came up in the nursery here at Rockmont. We paid very little attention to it but let it remain. After several years we began to realize that it was proving to be a good pink and quite unlike the other pinks in color. We planted a number of plants in our perennial border along with some thirty-five other kinds and have come to the conclusion that it is one of our finest pinks. It is a tall, strong grower and able to care for itself with a minimum of fuss and care. The florets

are a real pink without the salmon shade found in so many pink phlox. They do not fade early and make the heads look spotted. We are making no extravagant claims for this phlox but considering its many good points we think it a very worthwhile addition to any phlox collection.

CINDERELLA. I cannot pass up the pinks without saying something about this new pink introduced by Rockmont Nursery. It is a pale rose-pink with a faint eye. The color is lighter than Columbia. Flowers are good sized but not as large as some. When well grown it is a very lovely phlox. Most women admire it very much but it seems to lack sufficient snap and color to please the men.

SNOWCAP. We still think Snowcap is the finest white phlox. It has enormous, cone shaped heads and large pure white flowers. It is semi-dwarf with stout, stiff stems. It should be divided often as the flower heads are much larger on young plants.

MARY LOUISE. A fine new

white from Wayside. We think it not quite as good a grower as Snow-cap but it is a choice new white that comes highly recommended.

TAPIS BLANC. A dwarf white with large heads and very good flowers. A strong grower about the same height as Jules Sandeau.

NIA RUYS. Even shorter than Tapis Blanc. When given good care it will produce fine heads of white flowers a foot or less from the ground.

COUNT ZEPPLIN. (Graf Zepplin). There are a number of these white phlox with deep red eyes. This is, perhaps, the best of the lot. A good phlox making nice heads that remain lovely a long time.

PHARAON. An old variety with rosy-lilac flowers and a white eye. It flowers early and remains fresh looking longer than most kinds. If you like the color there are few better phlox.

SILVERTON. A clear, pale lavender with the largest of florets. A strong grower of medium height. An outstanding lavender.

CAROLINE VANDENBERG. Listed as one of the near blues. There are no blue phlox. They are all bluish-lavender in the early morning but change to a redish-purple or magenta under bright sunlight. A good lavender but far from blue.

KING LEAR. In 1935 Mr. D. M. Andrews introduced this phlox as a true purple that did not fade or

change color under different intensities of light. The available stock was soon sold out and it was withdrawn. Twice since we have offered this phlox only to have the stock quickly sold out. At present it is withdrawn. It is semi-dwarf, growing to around sixteen inches. Flower heads are large with plenty of fine flowers. If the proof of its value is shown in the demand for plants, it is a phlox that will be liked by many gardeners.

MISS LINGARD. One of the early or suffruticosa phlox. It has narrow, glossy leaves that are free from mildew and red spider. The flowers are white with a slight trace of pink. We have not had much luck with this phlox but others report excellent success with it.

There remains many other choice varieties of phlox but for lack of space I will give only brief descriptions. They are all outstanding and mostly recent introductions. They should make valuable additions to any phlox collection.

Beacon—Fine, bright cherry-red. Flash—Crimson with orange cast. July Lights—Bright light-red. Augusta—American-beauty-red. Harvest Fire—Salmon with orange cast. Thor—Salmon-pink. H. B. May—Light pink, dwarf. Cheerfulness—Orange-salmon. Geo. Stipp—Deep-salmon. Antoinette Six—New white. Winedot—White center surrounded by bluish-mauve. Widar—Violet with white center.

* * * * *

PLANT BREEDING in Colorado was recognized by the Legislature to be of paramount importance. An Eighteen Thousand Dollar appropriation was set aside for new experimental work. It is one of the many lines of work that a Rocky Mountain Botanical Garden would have as its activity.

* * * * *

Denver's new County Agent comes here from Durango: **MR. GORDON T. MICKLE.** He has a fine reputation and all Denver gardeners will give him enthusiastic cooperation.

ROCKY MOUNTAIN JUNIPER

(*Juniperus scopulorum*)

By SCOTT WILMORE

This tree is a native of Colorado. *Standardized Plant Names* calls it "Rocky Mountain Juniper". It is also called "Colorado Silver Juniper", and sometimes "Red Cedar", after its eastern cousin, the *Juniperus virginiana*. Colorado nurserymen universally call this tree, "Scop", and that short name is the one I shall employ here.

Few people realize the value and popularity of this Colorado native. I believe this is used more in Colorado landscaping than any other evergreen. While the Colorado Blue Spruce is undoubtedly better known throughout the horticultural world, and is perhaps, in more demand in other places, yet insofar as our own state is concerned, the demand is greater for the Scop than any other evergreen.

It is possible today to make a complete foundation planting of evergreens, at least for the normal home, using nothing but Scops, and yet obtaining the desired effect that one would achieve from an assortment of evergreens of different kinds and species. Since the grafting of Junipers became so popular, some six or eight years ago, we now have practically all possible types of Scops, to serve any and all purposes desired in a home planting. We have the silvers, the greens, and the blue casts, as well as other in-between colors for contrast effects; also the tall and slender (stovepipe effect) that resemble Italian Cypress; the short and fat types so to speak; and even the prostrate or semi-prostrate types such as are found in the Pfitzers and Savins. In addition, by proper occasional trimming, the globes and pillar types can be obtained, where an extremely formal effect is desired.

Any modern up to date Colorado nursery can now show a prospective customer practically all, if not every one of the above mentioned types and

more too. It is also a known fact, at least commercially, that every nurseryman handling Scops, has his own favorite type of graft. Also every nurseryman, whether doing his own grafting or having it done for him, has a particular seedling of his own that he has had grafted, which in most instances he believes to be just a little better than any other in the trade channels. On account of this, there are now so many varieties of grafted Scops being grown today, that space does not allow, nor do our records begin to show the countless number of varieties being propagated; and there still are plenty more yet to come.

Now for the novice who does not understand what is meant by grafting; it is rather a simple process of selecting an outstanding type and perpetuating this type by cutting off a tip, called a scion, and getting the scion to grow on another tree called the stock, or understock. Most Scops are propagated on a tree, the understock of which is *Juniperus Virginiana* (Eastern Red Cedar). This latter item is not only easily propagated from seed, but seems to have more push and vigor to it than do other varieties of Juniper; thus giving a faster and stronger growing plant to line out. Several years ago we made a very interesting experiment, in having grafted for us some *Juniperus scopulorum* on *Scopulorum* seedlings as understock, as well as the same variety propagated on *Virginiana* understocks. These were received by us about a week apart and planted in rows side by side in the nursery, and in three years the stock propagated on the *Juniperus virginiana* had the equivalent of an extra year's growth over those propagated on *Juniperus scopulorum*.

Grafting is usually done in January, on understock of two or three year seedlings, which have been pot-



Few trees are as naturally symmetrical as the Rocky Mountain Juniper in its juvenile state. Often a tree in the foothills will look as though it had been regularly sheared. It was such a tree that Mr. Sutherland used for his famous graft, a typical specimen of which is shown above. (Photo by James S. Holme).

At maturity the crown of the Scop. becomes more open, and often assumes very picturesque forms, like the patriarch shown on the cover. This tree is in the Garden of the Gods and was photographed by Mr. H. L. Standley. The illustration is taken from COLORADO EVERGREENS.

ted in advance when dormant in the fall, and set aside in a cool place for grafting later. Scions are then taken from the plant from which one desires to propagate, and the scions are matched as nearly as possible in caliper to the understock on which it is to be grafted. There are several methods of grafting, but probably the most popular one is the "slit" graft; a clean cut in the stock, about one-half inch long, just above the collar, slanting from the bark in toward the center of the seedling, and another long slanting cut on the scion, which is then inserted in the seedling and tied firmly with raffia or rubber bands, whichever is available. The grafted plant is then put under artificial heat in the greenhouse and forced as much as possible to get growth established on the scion. When the proper calluses and unions have been made on the plant, growth in the scion will soon start. When life is shown on the scion, the original top of the stock is cut off just immediately above the graft, thus throwing all the growth into the scion.

As one can readily see, this is a longer and more expensive process of propagation than is the sowing of seed and propagating in that manner. One might ask, therefore, "Why go to all this extra work and trouble for a grafted evergreen?" The answer is simple; this is the only way *identical* plants can be obtained for matched trees in formal plantings. As no two seedling Scops are identical in every respect; and since the contrast one gets from even the same lot of seed varies from blue to green, not to mention the various types of needle formations, as well as many other characteristics, we resort to grafting so that we may *know in advance* the color and form of tree we are propagating.

Junipers, unlike most evergreens, have the male or staminate flowers on different trees from those bearing the female or pistillate flowers. The

former trees bear the pollen, the latter the berries. The graft resembles its parent in this respect too. Some people, including the writer, feel that the berries add greatly to the attractiveness of a tree. A scion taken from a female Juniper will be a berry tree just as its parent was. So there are many reasons for seeking the more expensive grafted Scop, rather than the common seedling.

I would like to impress upon all home owners the necessity of checking their Scops several times through the growing season for possible insect infestations. The most prevalent pests here in this area are aphids and red spiders. Both are easily controlled if one does not let the infestation get bad before spraying. The aphids are very often quite hard to locate and there are several varieties of them. However they usually line the under side of the branches and start near the bottom of the tree and work upward as the infestation gets greater. If ants are detected crawling around the branches of the tree, it is most probable that the aphids are already infesting the tree, especially if the ants are in any quantity or number. A contact spray of Black Leaf 40 or similar material properly applied usually does the trick. Red spiders (which are not actually spiders but are mites) work from the inside out. For the red spider we have been using the liquid lime sulphur, one part of same to twenty-five parts of water. In fact when it is necessary for us to spray, we always use the double spray, combining the Black Leaf 40 and the liquid lime sulphur, using both on the one application. As a too strong solution of lime sulphur, applied in direct sun on a hot day, sometimes burns the foliage, it is well to use this spray on cloudy days. Black Leaf 40 never burns. I cannot stress too strongly the necessity of checking your Junipers, in all the various types, and continuing to do so, from May to October, especially for aphids. They are so prevalent

in and around Denver, and they have been so neglected, not only by the private home owner, but by the City of Denver as well, that it is absolutely necessary to get this pest eradicated if possible. Many of Denver's most beautiful Scops have either been ruined or killed entirely by bad infestations of aphids alone. The prevalence of these pests constitutes no objection to the planting of Scops, however, since it takes only a minute's time to check your trees occasionally for infestation, and a matter of another ten minutes to prepare and spray a normal sized tree where infestation is found. Be sure and look them over the first hot day, when they usually start working.

Scops are easily grown and just as easily drowned. It is a tree that does not require a great deal of water; in fact as they grow wild in their native state, they are usually found

on the southern and open slopes, where nature gives them less water than in sheltered areas and northern slopes and ravines, where moisture is more prevalent. One should use care in placing Scops, to see that they are never set directly under a downspout, or even in a low place where water collects. If this is impossible, then arrangement should be made by banking or even underground drains, to run the water away from the tree.

Many beautiful types of evergreens are not hardy enough to be grown in Colorado, due to our trying climate,—such as the *Arborvitae* for example. However I feel that Colorado is blessed with one of the finest of all evergreens, the Rocky Mountain Juniper, which, in the writer's opinion, serves more landscape purposes in our beautiful city, than any other evergreen.

ADAM KOHANKIE

The things which count in life are what we have done for others in work and kindnesses. There are no other. I am thinking of the days when Adam Kohankie, as President of the Denver Society of Ornamental Horticulture opened our little meeting in the library auditorium and stirred us all to greater efforts for the annual chrysanthemum shows and for a more beautiful Denver. I am thinking of the many, many things which he did for the people of our city in his thirty-five years of building the Denver parks, nearly thirty of which he spent as superintendent of Washington park. Born in 1864 in Plainesville, Ohio, the son of a family renowned in American Horticulture, Adam was 80 years old at the time of his death on February —, 1945. All his working years he spent in Denver and for Denver.

There was only a little beginning of Washington Park in 1907 when Adam took charge of the work there. We had a park commission those days and with vision and courage

they built this beautiful park. There was no South Denver in those days. It was built around the park. It became a beautiful residential section following the development of the park.

As Vice-President of the American Park Superintendents Society Adam brought to Denver the annual meeting of that group in 1913. The love and respect the Denver park men had for Adam carried through the American Society and from one of the national meetings came his nickname "The Duke of Washington Park". We all lovingly called him that.

It was no easy matter to make a fine park in Denver where nature bequeathed only a treeless plain. It was pioneering. If Denver has become the most livable city of the nation as many now believe it is we may well say that it is due to men like Adam Kohankie, led by the indomitable spirit of Denver people who were going to make this a fine city.

S. R. DEBOER.



EARLIEST TO BLOOM?

Cornelian "Cherry", *Cornus mas*, was in full bloom on March 31 in Washington Park. Mrs. Earl Davis discovered it west of the East road, south of Kentucky Avenue. Its bright scarlet fruit is said to be edible. Flowers yellow, small, in bunches.

A beautiful *Fire Thorn*, *Pyracantha coccinea*, is flourishing south of the porch at 883 South Downing. It is one of our few broad-leaved evergreens, with bright red fruit.

Science News Letter reports that production of new hybrids has been facilitated by the discovery of a strain of onions with exclusively female flowers and of tomato plants having pollen-less flowers.

* * *

Unlike the manufactured variety, natural gas has been found to be harmless to potted plants and cut flowers.

* * *

The exposure of parent plants of the Russian dandelion (*koksaghyz*) to a chemical treatment has resulted in doubling of the number of chromosomes in the cells of the offspring and development of larger roots containing a higher percentage of rubber. These findings were the result of experiments carried out by the division of genetics of the Carnegie Institution of Washington, whose yearbook has recently been published and is no doubt available at the Denver Public Library.

* * *

Penicillin has a new triumph to its credit, this time in the field of plant disease. Crown gall ('plant cancer') is reported to have been cured by the application of crude penicillin.

* * *

Plants have made possible a bit of detective work in connection with one of the many Baconian myths. The Voynich manuscript had been ascribed to Roger Bacon, but it has now been determined that at least two of the plants illustrated in it were unknown in Europe until after the return of Columbus from the New World.

* * *

An additional use for sugar beet pulp was acquired when it was found that the galacturonic acid of the pulp is a rich source of vitamin C (ascorbic acid).

* * *

BOOK NOTE

Bailey B. Pepper of the New Jersey State Agricultural Experiment Station is enthusiastic about Louis Pyenson's "Pest Control in the Home Garden", in a recent review of the book (*Jour. N. Y. Botanical Garden*, vol. 45, No. 538). It was published last year by Macmillan, and sells for \$2.00.

It is pointed out that the author is the first to consolidate in one small volume a great wealth of information on pest control by home gardeners. "The author has ably organized the subject matter and has emphasized the fundamentals of pest control", says the reviewer. "Preventive measures, crop rotation, cultural practices and hand picking are stressed, while chemical control is considered lightly, and rightly so, because many chemical insecticides and fungicides are scarce during the war period and, too, the recommendations for these materials are constantly changing from year to year." It is pointed out that the excellent illustrations plus the concise descriptions should make diagnosis of the pest in question quite simple for the amateur gardener. The reviewer considers that the author's advice on getting information on unsolved garden problems is well worth the price of the book, as too few gardeners realize that there are such sources of free information and service.

MOUNT GOLIATH NATURE STUDY AREA

By FRED R. JOHNSON



Soon after the first road to the summit of Mt. Evans was completed, a number of persons and organizations called the attention of the Forest Service to the desirability of preserving and protecting the beautiful specimens of timber-line trees along the highway near Goliath Peak. It was observed that some persons driving along this highway and seeing fine chunks of pitch pine, and more interested in gathering wood for their fire places, would unthinkingly saw or break off pieces of these grotesque, wind-driven tree tops, unmindful that some of these specimens had been battling the elements for 1,000 years or more. On the other hand, these specimens are a source of inspiration and study and artistic effort to nature lovers, artists, and photographers. Undoubtedly, some of the specimen trees along the Mt. Evans highway have been photographed thousands of times.

At the request of Allen S. Peck, Regional Forester, Supervisor E. S. Keithley studied the situation and recommended that an area of approximately two hundred acres, near timber line, on the slopes of Goliath Peak, be closed to the building of camp fires and that wood cutting be prohibited. Accordingly, on August 19, 1932, the SW $\frac{1}{4}$ Sec. 5 and NW $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 8, T. 5 S., R. 73 W., 6th P. M., in the Arapahoe National Forest, was set aside by the Forest Service as the Goliath Peak Nature Study Area. The building of camp fires without first having obtained a permit from a Forest officer was prohibited by this order for several reasons.

First, in extremely dry weather and with the high winds that often prevail at timber line, a camp fire might easily get out of control and

burn over a considerable area within sight of Denver. Goliath Peak is 12,200 feet in elevation. In the next place, persons building camp fires would naturally knock off the dry, dead pitch pine branches and tops of the timber-line trees, thus spoiling the beauty that the nature study area is aimed to preserve.

The order further went on to state:

"Regulation T-3 (D), of the Secretary of Agriculture, prohibits, under penalties provided by law, mutilating, defacing, or destroying objects of natural beauty or of scenic value on the National Forests. Timber-line trees are classed as objects of natural interest and beauty and their mutilation or destruction is, therefore, prohibited. Please preserve these trees for others to see and study."

Signs were posted along the highway, calling attention to the nature study area and warning against the building of camp fires and the mutilation of trees. A recent report from Edward F. Heaton, Supervisor of the Arapahoe National Forest, stated that the protection has been quite effective. Mr. Heaton stated that the Colorado State Highway Department had a camp in the area for several years, while the highway was being oiled. Upon completion of this job, the camp was moved and the site was cleaned up. Supervisor Heaton said that it is still necessary to warn people against the removal of dead bristle cone pine wood from this area.

There was considerable publicity about the nature study area when it was first set aside, but many persons have forgotten about it or have never heard of its establishment and purpose. It is appropriate to call this area to attention in connection with



"This Limber Pine at timber line, Mt. Evans, Colorado, is often times referred to as the tree with the 'Praying Mantis'."

the proposed Colorado botanical garden and arboretum. The Goliath Peak Nature Study Area can well be the alpine section of the botanical garden.

Here may be found beautiful specimens of timber-line trees, including limber and bristle cone pine, Englemann spruce, and alpine fir. Then there are mountain willows, various species of shrubs, and all of the flowering plants, perennials, annuals, sedges, and grasses, such as may be seen in the very natural models of

timber-line habitats displayed at the Colorado Museum of Natural History. Here on the slopes of Goliath Peak, with a little protection, a fine bit of timber-line country may be preserved. The general public may enjoy it aesthetically, while the scientist, the botanist, and the biologist can study its geology, vegetation, and animal life over the years, so that the changes that nature makes at this high, rugged elevation, where only the fittest survive, can be recorded.



QUERCUS QUIPS

WHAT'S IN A NAME?

When the grateful membership of the *Green Thumb* gave George Kelly a copy of *Standardized Plant Names*, he said, "Thanks, I have always *wanted it*."

I wonder how many other nurserymen in Denver—or in the United States—have "wanted" S.P.N.?

When I see a prominent wholesale house listing Douglasfir under "Abies" my irritation is only exceeded by that arising at the scholastic botanist who scorns S.P.N. because, forsooth, there are certain "inaccuracies."

What is the reason for the nurseryman's apathy? It was the nurserymen and the ornamental growers who organized the American Joint Committee on Horticultural Nomenclature thirty years ago to "make buying easy by bringing about, so far as practicable, the consistent use of a single standardized scientific name and a single standardized common name for every tree, shrub and plant in American commerce." The first edition of S.P.N. was published twenty-two years ago, and the monumental second edition in 1942. Yet today ninety-nine nursery catalogues out of a hundred "make buying *diffi-*

cult" by failing to utilize the text which the nurserymen themselves made possible!!

The antagonism of certain botanists to S.P.N. is most difficult to understand. It cannot be because of any lack of scholarly collaborators. Professor Rehder, Dr. Wyman and Dr. Dayton, to choose three of the eminent staff at random, are international authorities. Of course there are many plant names that many botanists disagree with. *That is the very reason why the text is necessary.* So we have this anomalous situation: The botanists agree that for over a hundred years chaos has existed in plant nomenclature; the botanists have never provided a registration mechanism, or even a standard work on nomenclature. Yet when the American Joint Committee, the Department of Agriculture, and a staff of the most eminent scholars in the country do the botanists' job—and do it well—they stubbornly refuse to accept it.

Nurserymen, come to life and use your own text!

Botanists, either produce something better—or keep still!

QUERCUS.

A CHILD'S GARDEN OF CHILDISH GARDEN VERSE

JOHN STOCKBRIDGE

The more I plant, the more I hoe,
The more I spray — the less I know.

Some people put their faith in praying.
(I get my best results by spraying.)

Roses ain't fragrant, hydrangeas ain't pink;
And listen here, Quercus: my compost don't stink.

Early to bed, early to rise,
Work like the devil — and fertilize!

I realize now I'll never see
A poem lovely as a tree;
But still I hope to sometime know
A tree Bob More won't try to grow.

Aconite
Is quite
A sight.

We grow chard
In our yard.

I like smilax,
Also lilacs.

CANTERBURY BELLS

How to achieve gorgeous masses of 30-36 blooming stems within the year,
out of doors.

A plant started from seed, requiring two seasons to come to maturity is a biennial; top-growth is made the first season and usually a fleshy root. The second year flowers and seed are produced. A few perennials are so short-lived they are really biennial and some biennials can be handled as annuals if seed is sown early enough.

To plant the seeds of Canterbury Bells with those of perennials at our usual time in early June is to place the plants in their true biennial class but in order to complete their life cycle—for bloom the following fall—seeds should be planted very early, as soon as the ground can be worked in the spring, in a bed cleared of all stones and roughage and raked very fine and level. The bed need not be rich for germination. This particular seed has excellent vitality and a high percentage of plants is usually secured. The seed should not be broadcast but planted in well-ordered drills about 6 inches apart. Use only enough soil to cover—do not bury them. So lightly do I cover seeds that I always take a good look to be sure none is left exposed. Firm the ground well—I always use the palm of my hand—for a close association of seed and soil. The bed should then be covered with newspapers or better with strips of burlap, with corners pegged down and watered only with the finest and gentlest of sprays. Keep the bed moist at all times, never wet.

The first leaves to push up are the cotyledons, which have been folded within the seed; the next are the true ones that display the true characteristics of the mature plant. As soon as the first true leaves appear, transplant to a well-prepared bed. Campanulas like a rich soil, and set about 10 inches to one foot apart. You will find the roots to be very fibrous, thin and hairy. Make a hole with a small round stick and drop the plant in, being careful not to curl the roots; work the soil well in around the plant, its full length from the bottom to the very top. See that the first watering is a good one and from this time on treat the plants as others, keeping the soil moist and loose on top. The plants will stand there, in seeming defiance but forming new roots, expanding to produce robust plants for later blooming. Soon great armfuls may be picked of lavender, purple, pink and rose, white and intermediate tones of crackling two-inch bells, so beautiful as to warrant planting a fresh batch of seed each year.

Campanula medium has three interesting forms,—single and the cup-and-saucer variety; this last has a colored calyx, like a saucer below the cup-shaped corolla. I am quite sure the name Canterbury, here is from Canterbury, New Zealand and not from Canterbury, England. Campanula (kam-pan'-you-la) is Latin for little bell. H. K. F.

~~~~~ LINES INTENDED TO SOFTEN THE HEART OF QUERCUS, THE NO- TORIOUS EARTHWORM HATER

~~~~~  
An earthworm saw another worm  
A-writhing on the ground.  
Said he, "My Darling, marry me,  
Oh, sweetest thing I've found!"  
She said, "No, that can never be,  
I'll have to be your friend;  
Because, you dope, now can't you see,  
I'm just your other end?"

I mostly try to be polite.  
But I talk rude to fire-blight.

~~~~~  
Some things don't grow so very well
For me, but bindweed sure does swell!

~~~~~  
Good-bye, old friend! I'll not be seein' yuh  
'Til you stop calling zinnia zeena.

~~~~~  
In a world so full of yes-men
I love to think of Walter Pesman:
Big and tall and brave and strong,
He loves to tell me I am wrong.

THE LADYBEETLE AND OTHER BENEFICIAL INSECTS

By MIRIAM A. PALMER,

ASSISTANT PROFESSOR OF ENTOMOLOGY AND ZOOLOGY
COLORADO A. & M. COLLEGE

Control of insect pests is absolutely necessary to success in growing nearly all kinds of vegetation. We have invaluable allies among the insects themselves. This is called biological control. Without this often unnoticed and unappreciated help the pests would increase so prodigiously that our artificial methods of control would be disastrously expensive in time and money and, even then, often sadly inadequate. A familiar example, showing the difference between presence and absence of biological aid is a case of the saving of the citrus-fruit industry in California from the ravages of the cottony-cushion scale by the *Vedalia* ladybeetle, which was introduced from Australia. This pest accidentally imported in 1868 had by 1880 become so destructive as to threaten the entire citrus-fruit industry in that region. The *Vedalia* ladybeetle, the native enemy of this scale, in a few years after introduction so reduced the numbers of its victims that it was no longer an important pest except for occasional local outbreaks which were promptly quelled by introduction of the said beetles. Another scale was likewise controlled by the introduction of a hymenopterous parasite. Indeed perhaps only when natural enemies are reduced or absent do serious insect outbreaks occur. Recognition of the beneficial insects and intelligence as to their habits is important so as to avoid mistaking friends for enemies and mistakenly attempting their destruction.

Several kinds of insects feed on other insects or their eggs. Some are predacious, i. e. they prey upon the victim; others are parasitic, living on or in the body and extracting nourishment from the tissues of the victim. Since the number of insects that are beneficial in biological insect

control is great, only a few of the most common will be discussed here. Among predacious insects, probably the first in importance are the lady beetles, also called ladybugs and ladybirds, next, larvae of syrphus flies, larvae of lacewing flies, and larvae of a certain midge-like fly.

LADYBEETLES.—The ladybeetle is best known in the adult stage. The shape is elongated hemispherical. The size may vary from a quarter of an inch in the common forms, down to one-sixteenth of an inch in length, or the size of a pin-head in the forms more rarely noticed. The color is usually yellowish-red with or without black spots, but some species are black with red spots, and others, particularly some of the tiny varieties, may be plain black.

The eggs are laid on leaves and stems of plants in compact patches of 20 to 30, standing on end side by side. They are elongated in shape, orange-yellow in color, and from one-twenty-fifth to one-sixteenth of an inch in length. Incubation period is from 3 to 7 days. The young, called larvae, are at first only slightly larger than the eggs, but when full grown may attain the length of one-third of an inch. They are rather alligator-shaped and bluish-black with yellow or orange spots. After about 14 days, the larvae change into an inactive stage known as the pupal stage. At this time the larvae doubles up with its head placed against the surface of the plant, then sheds its skin and becomes hemispherical in shape. At this time it is pale brownish-yellow with black markings. Pupae are attached permanently to the plant by the rear end and remain quite motionless except for flopping up and down of the unattached head end when disturbed.

After 4 to 7 days the adult beetle emerges.

Ladybeetles are beneficial in both young and adult stages. They feed on soft-bodied insects, such as aphids and scale insects, and even their own young when food is scarce. Eggs of bean beetles, potato bugs, and other insects, and even their own egg, are included in their bill of fare. Both young and adults feed by sucking the juices out of the victim or eggs until only the dead shriveled substance is left. A single larva may thus destroy from 30 to 100 medium-sized aphids in a single day, and an adult may destroy from 100 to 200.

SYRPHUS FLIES OR HOVER FLIES.—Syrphus flies are often seen hovering in midair hence the name of hover flies. The most common species are somewhat larger than houseflies and usually are banded with black and yellow on the abdomen. The eggs of this insect are placed on plants, especially among colonies of aphids, and are laid flat on a leaf. They are pearly white, elongated, and so small as to be barely visible to the naked eye. After a few days' incubation the eggs hatch. The newly hatched, footless maggots are hardly larger than the egg, but when full-grown may reach half an inch in length. Their color is greenish or pinkish with more or less black markings. The larval stage lasts from 7 to 10 days, after which time pupation takes place. The larva becomes inactive, shortens and thickens, and fastens itself to the plant or to debris nearby. A smooth shell-like covering forms over its body. This is the pupal stage which lasts for 8 or 9 days. At the end of this period the adult fly emerges and starts the cycle over again.

Adult syrphus flies feed on nectar of flowers; only the larvae attack other insects. The larvae are, however, very voracious, feeding by sucking juices from various soft-bodied insects. They are best known for their habit of feeding on, and thus

controlling, aphids. These larvae eat as many aphids per day as the ladybeetle larvae, but since the larval stage is shorter and aphids are not fed upon by the adult stage or fly, syrphids are not as helpful as ladybeetles in plant louse control.

LACEWING FLIES OR APHIS LIONS.—Sometimes among aphid colonies and running about on plant leaves are found tiny pale pinkish or greenish alligator-shaped creatures with a pair of long forceps-like jaws. These are the aphis lions, larvae of the lacewing flies. The adults are also called golden-eyes. The adults somewhat resemble miniature dragonflies, but are less than half an inch long. Their bodies and wings are pale green and their eyes are gold in color, whence the name golden-eyes. They lay their tiny pale green eggs singly on a hairlike stalk, very often in groups of six or eight. This stalk prevents the first larvae which hatch from eating their unhatched and defenseless brothers. These insects, like the ladybeetles and syrphus larvae, are cannibalistic. The larval stage is followed by the pupal stage in a cottony ball-like cocoon about the size of a grain of tapioca. The cocoons are attached to a leaf. When the adult has emerged the cocoon has a little open lid.

These insects are helpful in that the larvae devour other small soft-bodied insects and eggs. They are best known for control of aphids, whence the name aphis lions. In feeding, the larvae pierce the body of the aphid by means of their forceps-like jaws and completely suck out body juices.

MIDGE-LIKE FLIES. — Very small pinkish or yellowish-salmon colored maggots, about the size, or even smaller, than the aphids themselves, are sometimes found scattered through a colony of aphids. The adults of these tiny maggots are pinkishmidge-like flies somewhat resembling tiny mosquitoes. The tiny,

elongated, pinkish eggs are laid singly or in groups among the aphids on the leaf surface of the plant. The larval or maggot stage which follows, ends with the pupal stage. The pupae do not appear distinctly different from the larvae except by close inspection. Observed with a hand lens they show structures resembling pupae of moths. From these pupae emerge the midge-like flies which start the cycle over again.

The larvae of this fly feed on many soft-bodied insects, and even mites. Some species may even live as parasites within the bodies of aphids. They are most numerous and most easily found in aphid colonies. They feed very unobtrusively and, evidently, painlessly, by sucking the juices of the victim from a thin place on the underside of the body or between the joints of the legs. The aphid makes no attempt to escape, and is usually not drained entirely dry as in the case of the predators mentioned previously, but death results and its body soon turns brownish. The adult fly does not attack aphids. However, as this insect is very prolific it is a very valuable aid in the control of aphids.

PARASITES. — Often a colony of aphids may contain certain individuals which are colored differently from the normal ones and are rigidly fastened to the leaf. These aphids

are parasitized. The parasites are Hymenoptera, which are minute wasp-like creatures. The adult female parasite pierces the body wall of the aphid with her ovipositor and inserts an egg just beneath the surface. This egg hatches into a maggot-like larva which lives on the juices or blood of the aphid. The parasitized host seems normal for a time though probably reproduction is halted. When the parasite has attained its growth it causes the death of the aphid. The maggot-like larva then makes an opening through the under side of the aphid through which it glues the plant louse to the leaf. The body covering of the aphid then hardens, forming a protecting shell for the parasite which remains within or underneath and pupates. The dead aphid bodies may appear white, black, or tan in color. When the parasite has matured it cuts a round hole in the back of the dead aphid body and emerges as a winged wasp-like adult. Sometimes these parasites are very numerous and may completely rid an entire locality of a particular species of aphid infestation.

There are probably no insects which are not subject to attack by some particular kind of hymenopterous parasite. Caterpillars, cutworm larvae, grasshoppers, and many other insects are continually held more or less in check by parasites.

LILAC ISSUE AVAILABLE — IF

The special Lilac Issue received favorable comment all over the Country. We still have some copies left. We want them to go to *new* subscribers—For \$1.00 we will send (a) copy of Lilac Issue, (b) March and May 1945 numbers, (c) all subsequent numbers of *Green Thumb* up to January 1946—

We want more people to know the *Green Thumb*.

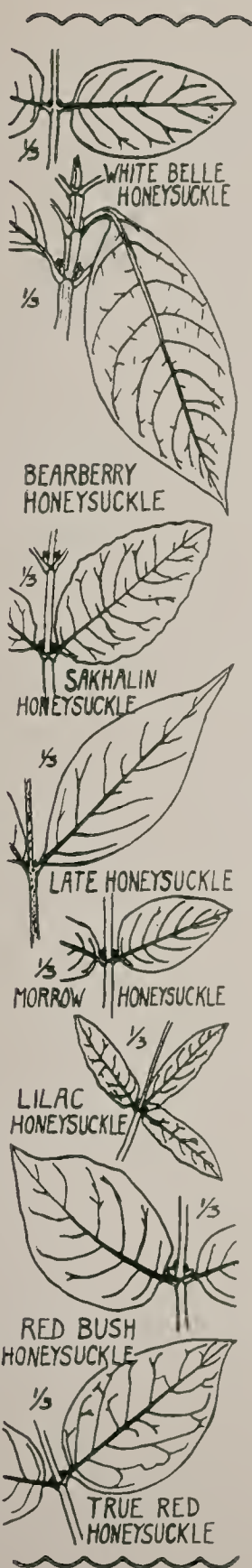
Put up a dollar for a friend and take advantage of this offer. If you don't want to give the *Green Thumb* to a friend at least *tell* him of this offer.

HONEYSUCKLES FOR COLORADO

Here is the report of a recent survey conducted and reported by the editor.

The returns from our recent survey of Honeysuckles grown in the state emphasizes more strongly than ever our need for scientific experimentation with plants in the Rocky Mountain area.

Bailey and Rehder each list 70 species of the genus *Lonicera*, with many varieties; yet some 40 of the 45 replies received from over the state mentioned not over 5 species. If we should be governed entirely by the number of times some species were mentioned we would have to recommend some inferior kinds; for people have mentioned only those that they were acquainted with, while many of the better sorts are not generally known. The nurserymen of the state are not entirely to blame for this situation, as they must raise the plants that the public calls for or go broke. A few nurserymen have introduced some superior kinds, but we badly need more extensive and scientific experimentation. Of course a few of these 70 species mentioned



are not hardy here, and are inferior kinds, yet it seems that a genus of this size which has supplied some of our most useful plants would have many more suitable for our use if we knew of them.

Of the kinds which were mentioned most of the bush form seemed to be hardy as high as 7,500 feet, and in some sections of the state they are included in the few things which will survive. For instance the Tartarian Honeysuckle has been the mainstay for hedges in the San Luis Valley, and has proved itself hardy in the impossible "contractor's soil" around many Denver homes. Some of the honeysuckles will survive in very poor soil and with little care.

To simplify this report we will divide the Honeysuckles which have been grown in the state into three groups: 1. Tall Bush; 2. Dwarf, and 3. Vining.

TALL BUSH HONEYSUCKLE

The Tartarian Bush Honeysuckle, *Lonicera tatarica*, leads all others in popularity in the state. It has filled a place in Colorado ornamental plantings which has been very valuable, yet there are others which are generally superior. It will stand much abuse but it soon grows to be very coarse and out of scale for residence plantings. The variety "rosea" was the most generally known, with "alba" and "rubra" close behind. These colors may be true to name in the East, but here are all a little lighter, the "rubra" being a medium pink. Of the true Tartarian the variety "Wheeling" has a darker flower and is a superior kind. The variety "grandiflora" has larger white flowers and larger leaves, while "sibirica" has deep pink flowers. The Tartarian has hybridized so much with Morrrows and others that probably few plants now in cultivation are of a pure species.

The Morrow Bush Honeysuckle, *L. morrowi*, was the next best known species. This shrub is usually of more spreading habit than the Tartarian. The leaves are green above but gray beneath. The flowers are at first white, changing with age to a creamy yellow, and the fruit is usually red, but sometimes yellow.

The White Belle Bush Honeysuckle, *L. bella albida*, and the Pink Belle, *L. bella rosea*, are the result of a cross of the first two species mentioned. They have more of the character of the Tartarian and are usually quite showy in flower and fruit.

Lonicera chrysantha, *demissa* and *ruprechtiana* are all in this same class, and are very similar in appearance to the Tartarian. They are often hybridized among themselves until they have quite variable habits of growth, and color of flower and fruit.

Lonicera xylosteum, more nearly resembles the Morrow, but is usually not so attractive.

The Late Honeysuckle, *L. maacki*, variety, *podocarpa*, is somewhat like the Tartarian in general habit, but grows much faster, and blooms much later. The fruit are smaller, dark red, and hang on the plant most of the winter. It has proven very hardy in much of the East, but here it occasionally kills down to the ground over winter. This may be because of its rapid and late growth.

Of this tall class, the Blue-leaf Honeysuckle, *L. korolkovi*, has many qualities to make it superior to any of the above. The leaves are smoke gray and very attractive. When in bloom the masses of "appleblossom pink" flowers backed by the gray foliage are very attractive. The habit of growth is irregularly spreading. This is usually a better shrub than the Morrow. The variety "zabeli" of the above is more of the Tartarian habit of growth, but is smaller stemmed and more symmetrical. The flowers are of the darkest pink and

much more profuse. It is easily the finest of all the tall honeysuckles. At the time that all honeysuckles are in bloom this kind stands out above them all.

The last two kinds mentioned could well take the place of all the others in this class.

DWARF HONEYSUCKLE

Only a few people in the state had ever had experience with the lower growing bush honeysuckles, yet this class includes some very useful shrubs.

Lonicera maximowiczii sachalinensis, in spite of its terrible name, is a nice little shrub, seldom growing over four feet high. The bloom are tiny dark red bells growing all through the plant. The leaves are at first purple and crinkly. Its chief fault is that in good soil it is liable to grow too fast and then fall down. This fault could be remedied by shearing or keeping rather dry. Its chief possibility seems to be in using it as one parent in crosses with those kinds which grow too large. This should be one of the first jobs for our new arboretum.

The Lilac Honeysuckle, *L. syringantha*, and the variety, *wolfii*, are delightful shrubs. They will grow three or four feet high with a spread of six or eight feet. They must be planted in some place like the top of a bank or wall as they hug the ground closely. Their charm is in the small clusters of flowers of the color and fragrance of lilacs. A few blooms placed in a closed room or car will fill the whole place with their delightful fragrance. There is usually a mass of bloom in May and a few scattered heads all summer. The fruit are small bright red berries which the birds seldom leave on long. Here is another good subject for experimentation in hybridization.

Lonicera thibetica is in many ways similar to the above, but lacks the especial charm of that plant in bloom and fragrance.

Lonicera spinosa alberti is another of this class, more scraggly and low than the above, but a hardy little thing that should be used more.

Lonicera villosa is reported by the North Dakota Experiment Station to be a dwarf honeysuckle of much promise.

Among the lower honeysuckles we should mention the "Fly" types. Our own native, *Lonicera involucrata*, is one of these. Its chief attraction is the pair of large black "berries" surrounded by the large red involucre. In the mountains it is very beautiful, but often under cultivation it grows too fast and falls flat.

The species "ledebouri", from California, is similar to the above but more handsome in habit of growth and more tender.

Lonicera fragrantissima is a favorite in the East and South, where it is half-evergreen. It has tiny flowers very early in the spring which are very fragrant. All report it as killing to the ground every winter in Colorado. *Lonicera standishi* and *L. nitida* are similar to the above and have not proven hardy here.

VINES

Of the vining types of honeysuckle, three were very generally known over the state, but were reported as not hardy at higher altitudes.

The Halls Japanese Honeysuckle, *L. japonica halliana*, was a general favorite. Over much of the state it is partly evergreen, but several reported it as winterkilling part way back. It is a rugged grower and the creamy white flowers are very fragrant. It is useful to climb over a trellis or scramble over a bank and rocks. The word "honeysuckle" to many people means this vine. The variety "purpurea" has purplish tinted leaves, otherwise much the same. The variety *aurea-reticulata* is a

dwarf growing kind with mottled vari-colored leaves, usually grown as a greenhouse plant.

The Scarlet Trumpet Honeysuckle, *Lonicera sempervirens*, is well known, and rightly so. While it lacks the fragrance of Halls it makes up for it in its brilliant red flowers. It is often not quite as vigorous in growth or as nearly evergreen as Halls.

Lonicera sempervirens sulphurea is a yellow form of the above which is little known in Colorado as yet.

Lonicera heckrottii, while a newcomer, is becoming well known. It bears red and gold trumpets over a long period, on a vine which can be trained as a climber, shrub or ground cover. It is very attractive and usually hardy. The variety with the trademarked name "Goldflame" is, we suspicion, a choice selection from this species. It is a very fine plant and useful in many ways.

Lonicera periclymenum and *L. caprifolium* have yellowish-white flowers and habits of growth similar to the above. Their main use is to make a variety in color and effect where several vines are planted.

Lonicera grata and *tellemon* have been tried recently but no results are available yet.

Without a doubt there are many more honeysuckles which would be suitable for growing in Colorado, and they would add to the variety and interest in landscape plantings. One progressive nurseryman in Loveland is trying out a kind called *L. coerulea edulis* which is a dwarf plant with gray leaves and edible fruit. We have heard of several that are being developed by the experiment stations in Canada and the Dakotas. The honeysuckles will probably always be among our shrub standbys, and we should know more about their usefulness.



Seasonal Suggestions



May and June

Usually there are about two weeks early in May when the horticultural world looks like our conception of the Garden of Eden. New leaves are breaking out everywhere, the soil is loose and mellow, weeds are inconspicuous and the air is comfortably cool. Buds are opening into fragrant beautiful flowers and the whole world looks fresh and perfect. Better enjoy these days to the utmost for we know that soon after the plants come to life insects also start their feeding, the soil will dry out and harden, weeds will start to choke out valuable little plants and hot winds will wilt the tender plants. If you will carefully watch your plants and get the jump on the insects, weeds and drouth, you can avoid a great deal of damage. Learn to recognize the damage of different kinds of insects and combat them with the appropriate kind of spray or dust. Early cultivation will get the weeds with a small amount of effort compared to the work required later if they are neglected. Early cultivation will also help to conserve moisture and keep the soil in a workable condition.

PLANTING

The planting of shrubs and trees should be pretty well over by now, but if they are handled carefully and promptly some can still be moved for a while. Perennials can usually be transplanted all summer long if moved with some soil attached. Better wait until settled weather to set out plants of tender annuals. This time is usually after the middle of May.

Do not let newly transplanted plants get too dry, but of equal importance is to not over-water. It is much better to water thoroughly every two weeks or so than sprinkle the surface every other day. Colorado cedar and elm trees are especially averse to having the ground kept soggy around their roots after they have been transplanted. Some newly transplanted trees and shrubs will be benefitted by a spray of water over the tops occasionally. Especially difficult things will appreciate a partial shade or wrapping until they get established. Many newly transplanted things are killed by kindness. This is usually overwatering and putting fertilizer near the roots. Good soil is essential for the growth of good plants but to attempt to make up for poor soil by putting lots of fertilizer around the roots is liable to be fatal.

SPRAYING

Check your Colorado Cedars carefully every few days all summer for the presence of aphids. They are gray insects about an eighth of an inch in diameter and are found closely massed on the small twigs usually near the bottom of the tree. Any contact spray or a hard pressure of water will get them.

Elm scale loosens up as the new leaves come out and can be easily washed off with a strong stream of water. They are thickest on the under side of the lower limbs where they are easy to reach.

The galls on spruce tree limb tips should be picked off as soon as they can be detected. After they dry up and become conspicuous is too late to do more than improve the looks of the tree. If we would all watch our Douglas Fir trees in June and spray with a contact spray when the spruce gall aphids have migrated to them, we could help greatly to control the damage to the spruce.

CULTIVATING

If the Downey Brome Grass has become established in your garden you must get after it early. It is easily eradicated early in the season, but becomes a bad problem later.

Avoid two of the bad examples of some of the city parks men; that of raking off ALL the leaves around trees and shrubs and then spading deeply. Better work in the duff around the plants by shallow cultivation.

As soon as the new leaves start, is time to begin to trim out dead or damaged limbs caused by hail, winterkill or other things. Most of the extensive trimming of shrubs should wait until AFTER they bloom. Maple trees may be trimmed after they come in leaf.

Start this spring the habit of making notes about improvements possible in your garden, and new plants which you have seen or heard of that you would like to try. There are many borderline plants that are fun to experiment with, but there are many seen in eastern catalogs which are a waste of time and money to attempt to raise here. One of the purposes of our organization is to acquaint you with these various plants.

Again we warn you not to cut off the leaves of tulips until they have dried up. These leaves are necessary to manufacture food for the new bulbs being formed. Plant annuals around the tulips and let them hide the withering leaves.

The Green Thumb



July - August - 1945

~~~~~ THE GREEN THUMB ~~~~~

A Bulletin of the

COLORADO FORESTRY AND HORTICULTURE ASSN.

Organized in 1884.

George W. Kelly, Editor

L. C. Shoemaker, Office Manager

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"To preserve the natural beauty of Colorado; to protect the forests; to encourage proper maintenance and additional planting of trees, shrubs and gardens; to make available correct information regarding forestry, horticultural practices and plants best suited to the climate; and to coordinate the knowledge and experience of foresters, horticulturists and gardeners for their mutual benefit."

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VOLUME II

NUMBER 4

1100 REPORTERS

WE WOULD like to have each one of the eleven hundred members of the Association feel that it is their personal responsibility to report to the editor items of horticultural interest. Let us know what sort of information you want, or do not want, to see in this bulletin.

We appreciate very much the fine cooperation we have had from many of our interested members. These include many professional horticulturists as well as those who are just scientific plant lovers. The fact that most all the worthwhile landscape architects, nurserymen, gardeners and horticultural teachers have been very active in the Association and very helpful in supplying material for the Green Thumb has been a great satisfaction. Some have observed that it is a natural thing for these professional people to be interested in such an organization as this; that they are working for their own interests. We have found that it really works the other way around; that they are nurserymen or gardeners because they are interested in horticulture rather than their being interested in things like this Association because they want to promote their business. The nursery "peddlers," pseudo landscape architects, "ash hauler" gardeners and those interested from the business standpoint only are not members.

More and more, as the association and the bulletin becomes better known, people are looking to us to lead the way in things horticultural; in promoting living memorials, horticultural education and in supplying horticultural information applicable to our state. We feel this as a great responsibility and would appreciate suggestions and criticisms from any reader which might help us to furnish the right kind of leadership and avoid half truths and untried practices.

Picture on front cover of Linden Tree in City Park, Denver, by Robert E. More.

WATERSHEDS AND WATER YIELDS OF COLORADO

By JOHN W. SPENCER
Regional Forester

PEOPLE are funny.

We do a lot of talking about things which we do not wholly understand. Many of us glibly repeat words and phrases without grasping their full import, or realizing their significance in our daily lives. In short, we take the basic things of life for granted.

Now, for example, I imagine that every man and woman in this community feels that he or she is quite familiar with soils, with erosion, with watersheds and water, but how much do we really know about these things? Take, for instance, our soil resource, which economists tell us is the source of all wealth. It is far more than this, for it is the very basis of all human existence. It is the soil which produces the grass, the herbs, the shrubs, the trees upon which our lives depend.

Furthermore, did you ever stop to realize that virtually all of this important vegetable life is produced from some 18 to 20 inches of top soil? The subsoil and the rock masses of the earth produce practically no vegetation whatever. It is humanly impossible to realize how exceedingly thin is this critical layer of top soil in relation to the mass of the earth itself. The thinnest coat of paint that could possibly be brushed on the largest office building in Denver would be several hundred times too thick to be in true scale.

In short, we human beings live or die, we feast or we starve according to the way we treat this almost impalpable coating of soil on the earth's surface.

When we stop to think of the carefree, irresponsible way in which we treat this skin of top soil, it is a wonder that any of us are here today. Erosion, if allowed to go unchecked, can destroy all prosperity, and even human life itself, more completely and more effectively than wars and pestilence combined. Scientists tell us that it takes nature approximately 5,000 years to produce an inch of top soil. I cannot testify to the accuracy of this from personal experience, and I can't see that it makes much difference whether it takes 1,000 years or 5,000 years to make an inch—I do know that we can easily **lose** this inch of soil in one year.

It's bad enough to abuse forests, brush, and grass lands and lose these crops. However, the real loss comes through the destruction of this protective vegetative cover which allows the soils to wash. This damage, all too often, reaches the point where it becomes irreparable.

Consequently, the preservation of our soil capital must be the foremost and dominating consideration in all forms of natural resource conservation. This applies equally to forest lands, range lands, and farm lands. This is the big job and the prime responsibility of our good friends in the Soil Conservation Service. It should also be the responsibility of every land-managing agency and individual. Just keep in mind, please, this little thin tissue paper skin of soil upon which we humans live and swarm like bugs, if ever you are inclined to feel that foresters and soils men are over-



Upper picture was made in order to show the relationship between the high mountain forests and the agricultural lands at lower elevations, for the water necessary for irrigation of agricultural crops. The valley is part of Uncompahgre River below Ridgeway, Colorado. The mountains include Mt. Sneffels which appears in the central background.

Lower picture shows a band of sheep grazing near Molas Lake in the San Juan National Forest. Photos by Jay Higgins.

emphasizing this erosion business.

Now, we are ready to talk about water.

To most of us, water is just something we get when we turn on a tap, something that we associate with more or less regularly on Saturday nights, or a substance that we see running loose in our streams. Most of us don't stop very often to consider the significance of our water supply nor its origin.

In short, we usually think of water, when we think of it at all, as a gift freely provided as a matter of course by a kindly Providence. Wholly apart from personal or domestic uses, water occupies an especially important place here in the semiarid West. It is the economic life blood of all sustained enterprise and prosperity in this region. Without it, even human existence in terms of modern civilization becomes impossible.

Now for a few facts and figures. The Continental Divide is literally the backbone of the land areas of this nation. The highest portion of this divide lies squarely across Colorado. Colorado, with its actual mean elevation of 6,800 feet above sea level, towers 200 feet above Wyoming and far above all the rest of the states. Approximately 75 per cent of all land surfaces in the Continental United States, having an elevation of 10,000 feet or over, are located in Colorado alone. From this great roof top the run-off of surface water in measurable stream flow averages 16,600,000 acre feet in a year of normal precipitation. All of this tremendous quantity of water originates in this state, and, without question, is by long odds the most important and most valuable of Colorado's natural resources.

Just what is the relationship between altitude and water production? All of our water comes from natural precipitation, principally in the form of rain or snow, and the amount of precipitation increases with increasing altitude. Water gathering values, sufficient to produce measurable and visible water in the form of stream flow, begin apparently somewhere around 7,500 feet above sea level and increase very sharply with increasing elevation. At the lower elevations the loss of water, through evaporation and transpiration, exceeds the amount of natural precipitation. Consequently, these areas contribute nothing in themselves to stream flow. Once in a while we get violent cloud bursts in the low foothills which create flash floods, usually doing a terrific amount of damage without producing any usable water. The high mountain country, however, produces more water than is lost through evaporation and transpiration, and does it year after year quietly, steadily, from melting snow and not in the form of cloudbursts.

Here are some figures compiled by the Colorado Water Conservation Board. The average precipitation for the entire state of Colorado is sixteen and one-half inches yearly. This is the equivalent of 93 million acre feet of water. Yet, the measurable stream flow in the same average year is only 16,600,000 acre feet. The difference between the 16,600,000 acre feet of stream flow and the 93 million acre feet of total precipitation represents this evaporation and transpiration loss I've been talking about — a loss of 82 per cent.

In brief, only 18 per cent of our precipitation becomes available in the form of stream flow. Yet, this residual 18 per cent makes

Colorado one of the most important water-producing states in the Union. Parenthetically, Wyoming is the other major producer, and the two states combined lead the nation. Out of Colorado's available water production of 16,600,000 acre feet five and one-half million acre feet, or just about one-third are used within the state. The balance of a little over eleven million acre feet flows across the state boundaries, bringing life, industry, and prosperity to a thirsty arid empire. Part of this water goes to Nebraska and Kansas, and a much larger amount to Utah, Arizona, New Mexico, California, and the Republic of Mexico. Even sunny, self-sufficient southern California is vitally interested in Colorado's water.

Just what is an acre foot of water worth? Naturally, this depends upon the use to which it is put. Again, using Colorado Water Conservation Board figures, we find that Colorado field crops for the twenty years preceding 1942 averaged \$7.45 an acre from dry lands and \$28.75 from irrigated lands. Hay and grain and general farm crops averaged \$16.00 per acre, while specialties like sugar beets, fruits, vegetables and truck crops yielded over \$103.00 per acre. An acre foot of water in Colorado may be worth only \$3.00 when used on mountain hay lands, but that same water may be worth four or five times as much when used with specialty crops. Colorado River water impounded behind the Boulder Dam is delivered to irrigators at \$15.00 per acre foot. The City of Los Angeles valued its supply of Colorado River water at \$100.00 per acre foot before the war and before its population figures started to jump. As a matter of fact, there is no ceiling

when computing the value of water for domestic purposes. Just for the sake of having some figure to tie to, it is safely conservative to figure the cash value of Colorado's average annual crop of water at \$3.00 per acre foot. For 16,600,000 acre feet, this means that our annual water yield is easily worth fifty million dollars. Actually, in terms of the downstream uses to which two-thirds of this crop is already directed, the annual value is probably four times as great.

As I told you before, the great bulk of this water comes from winter snows deposited in the high, wild, tangled mountain lands along the ridge tops of this state, beginning at perhaps 7,500 feet and over.

Probably the real water-producing lands of the state do not exceed an area of twenty million acres. Very well, if twenty million acres produce an annual water crop worth fifty million dollars, then the yearly production of each acre is worth \$2.50. Capitalize this at 5 per cent, and you come out with a watershed value for these rough lands of \$50.00 per acre. Fantastic? Well, that all depends upon the point of view, but no one can dispute the fact that these figures are almost absurdly conservative.

At any rate, it is evident that the perpetuation of this water crop, irrespective of what dollar value you give it, must and should dictate the management of the high mountain watershed lands. The national forests within Colorado contain a gross area of over fifteen million acres and include at least two-thirds of the important watersheds. Considering relative elevations, the national forests may control an even

higher proportion of the water production.

The mere creation of a national forest does not, of course, increase the amount of snow and rain deposited upon any land surface. However, forest land managers can manipulate the vegetative cover on the soil so as to profoundly affect both the character and the volume of water that is ultimately derived from any watershed.

The Rocky Mountain Forest and Range Experiment Station, operated by the Forest Service at Fort Collins, has, for some years, been conducting some extremely significant research in this field. Our scientists have found that by proper cutting and thinning of our high-altitude forests, the deposition of snow can be increased, evaporation losses cut down, better percolation into the ground induced, and the yields of usable water in the form of measurable stream flow increased by as much as 20 to 30 per cent. A purposefully managed grass and brush range that is properly grazed by game or livestock shows the same trends. These leads are things which cannot be laughed off, and, believe me, water users are beginning to sit up and take notice. If the Forest Service is successful in working out simple rules of practice for forest, brush, and grass land types which will increase the average yields of usable water for the major streams of this state, it will have contributed probably more to the permanent economy of the West than all of the Colorado livestock grazing and the timber growing combined. But, the gratifying part of the picture is that moderate livestock grazing and sensible timber cutting can be used as actual

working tools for developing the water crop.

This statement warrants a bit of explanation. You know, of course, that a watershed should bear a protective vegetative covering of trees, brush or grass. This covering is needed to maintain a porous absorbent top soil and to prevent erosion. But, if the mat of vegetation is too dense, it intercepts too much precipitation, particularly snow, and this results in a tremendous evaporation loss and the vegetation itself uses up a lot of water. In places where the timber is too thick, the snow is unable to reach the ground and pile up in large drifts. On the other hand, snow that falls on bare slopes or parks is constantly exposed to wind action and consequent evaporation losses. Furthermore, the snow that falls out in the open melts too fast in the first warm days of early spring and contributes to high flood stages without doing anybody much good. What this all boils down to is the fact that there is a nice point of balance between maximum usable water yields and just the right amount of vegetative cover.

The technique of proper watershed management to produce maximum water yields has never been fully worked out anywhere in the world, to the best of my knowledge. This is the sort of study the Forest Service is pioneering right here in Colorado. If the public, through Congress, will give the Forest Service enough funds for adequate research and will then support the land use policies resulting from such research, we will guarantee not only to maintain your water supply, but to actually increase it.

There is still another angle to this water question. I've been speaking of usable water. Now,

what is usable water? It is water which, from the standpoint of irrigation, domestic supply, and other ordinary uses, is sufficiently free from silts, sand, and gravel that the expense of settling and clarification is not prohibitive. Much of the flood water from spring run-off and from summer cloudbursts is economically unusable. Erosion is the major factor affecting the usability of water. It not only spoils the water through silting, but makes land surfaces unproductive at the point of origin and often deposits great quantities of sand, gravel, and rock on other lands downstream, and thus spoils them also. Erosion, once started, involves heavy expense for control measures and may often damage land to the point where restoration becomes difficult, if not impossible. Preventive, rather than restorative, treatment is much more logical and efficient.

Many privately-owned tracts of rough land, both inside and outside the national forests, are unfortunately being destructively and improperly used, and are creating erosion problems of great magnitude. In some cases, this erosion within the water-producing areas is injuring usable water yields, in other areas the silt loads are washing into and spoiling downstream waters. The owners in too many instances are not interested in the care of their properties. Why should they be? Frankly, they get nothing out of upstream management that redounds to the benefit of the general public or to property owners perhaps many miles away. Sooner or later, Colorado, in its land-use planning, must squarely face the problem posed by these sub-

marginal forest and range lands back in our mountainous areas. We just cannot afford to subsidize uneconomic use of such lands, and still less can we afford to sit idly by and see them go to pot.

I can see no satisfactory answer other than to recapture those lands through purchase at a fair price and place them under systematic permanent public management.

Please do not misunderstand me. I do not advocate any wholesale or general purchase of private lands by the state and federal governments — most certainly not any lands that can stay on the public tax rolls and pay their way.

I am referring just to those critical lands which, because of steep slopes, loose soil, and poor crop capacity, are injuring or threatening to injure our water supply.

We, here in the West, spend a lot of money and effort on diversion, storage, and engineering works, and we spend a lot of time on adjudication of water rights and in interstate controversies. These things are all right, of course, but it seems to me that we ought to pay at least some attention to the water resource itself, to the necessity of protecting it, and most certainly to the desirability of increasing it.

It's high time that we, in Colorado, recognize that water is our major natural resource, and that protection of the land areas from which this water comes, whether that land be national forest, state, or private, should be the dominant consideration in managing that land.

WHY DO WE PRUNE SHRUBS?

By D. W. SPANGLER
Pioneer Nurseryman of Longmont, Colorado

THE pruning impulse strikes us because:

1. We seem to have a cutting trait or instinct—a carry-over from the childhood of the race. Whittling is a symptom.

2. Our neighbor has pruned his trees and shrubs. We go him one better by whacking off more than he did.

3. Dense growth of shrubbery in our parks makes trysting places for the young. So we spoil the beauty of the parks and our kids can go on out to the road-houses.

4. The lower branches of the shrubs interfere with mowing the lawn, so we cut them off and leave the plant leggy and unattractive.

If they are your shrubs you have the right to prune them to your liking. If you have done a good job at it, you have enhanced the value of your property. If your neighbors follow your good pattern of pruning you have become a benefactor to your community. On the other hand if you have ruined your shrubbery by bad pruning, it may give your neighbors and passersby a pain in the chest. The sale value of your property may have been reduced hundreds of dollars, and if your neighbors follow your pattern of bad pruning you may have done irreparable damage.

We plant shrubs mainly for their beauty. Every kind of shrub has its own individuality. We cannot prune beauty into it, nature does that. But we can assist nature materially by judicious pruning.

Judging from pruning results we see here, there and every-

where, we must formulate two definitions for the process.

I. Pruning is a method whereby we enhance and perpetuate the beauty of the plant.

II. Pruning is a method whereby we remove the beauty of the plant, bit by bit, or in one swoop, and deposit it upon the ashpile.

In general, most of the shrubs in common use, if planted and given growing space, will in a few years, express their individuality, if not pruned in the meantime. They will be much alike in their general form. They will have few too many stems radiating out from the crown of the root, growing horizontal near the ground and perpendicular in the center of the plant—appearing fan-like in vertical section. Figure 1, the Colorado Red Dogwood, illustrates the point. This particular shrub was planted about ten years ago and had never been pruned until the snap-shot was taken. "Before" and "after" views were obtained and they looked so

Figure 1



much alike that only an expert could see the difference, though an armful of stems had been removed. This pruning satisfied rule I.

Figure 2 shows what remains after a clump of dogwoods was pruned. They were the same age as that in Figure 1 and similar in appearance. They had never been pruned, and according to our judgment they were perfect in form and beauty. A well-meaning caretaker did the cutting last season. This represents pruning under rule II.

In fact a large percent of pruning is done under the same rule. The shrubs in Figure 3 were planted for a screen on the street side of a girls' physical training court. Before pruning they were leafy from top to bottom and formed a perfect screen. They typify the naked, unattractive shrubs seen in many places.

A few remarks about one of the most maligned shrubs may be in order — namely the Bridal Wreath. I might say here that if any one can name a shrub that will fit into more places and emit as much beauty, I am in the market for it. Our town looks its best during the month when it is in bloom, and the "neglected" plants are usually the most attractive.

Bridal Wreath is our modest shrub. It bends over so very gracefully to hide its legs.

Figure 3



Figure 2

Figure 4 is that of a Bridal Wreath planted upon one of our school grounds about ten years ago. It has never felt the blade of a pruning shears since it was planted. When in bloom, flowers and foliage almost touch the ground because of the added weight. Then its beauty is complete. It needs thinning now. In fact, Bridal Wreath and some other shrubs may be kept youthful by removing a few of the oldest canes each year and allowing as many new ones to mature. Many people do just the opposite thing—a wrong practice.

In general it may be stated that **all the pruning most shrubs need is the removal of dead wood, straggly branches, and a thinning out of excess stems or canes.**

Therefore, after you have landscaped and planted your home, throw your pruning shears into the cistern and let nature do the rest—and we mean this almost literally.

It is almost axiomatic to state that shrubs which bloom on new

wood in the latter part of the season should be pruned when dormant, and the spring bloomers should be pruned just when the flowers have faded. We would add another rule almost correct: Prune shrubs down and trees up.

In some of the Viburnums, Beauty Bush, Mock Orange and some others, after well established they will send up new stems, which will reach considerably above the body of the plant. These should be cut out or lopped off unless greater height is wanted.

Hydrangea A. G. Hibiscus and Tamarix should be cut off close to the ground when planted, and in every spring thereafter. Our arid climate kills the stems partially or entirely during the winter season.

A discussion of so called formal pruning is out of place here. By formal pruning we mean operations that will destroy the individuality of the plant as shearing of evergreens and trimming of hedges. An article discussing this phase might not be amiss.

The writer of this article spent his youth about twenty miles from

Figure 4



the Missouri river in Kansas near the Nebraska line. This was in the eighteen seventies. Then the stream courses were margined with forests, in some places a mile or more in width. The outer zone was composed of scrub oak, sumac, hazel nut, prickly ash and other small species. The next zone included larger species, as hickory, linden and buckeye, and in the third, or middle zone adjacent to the streams were found the American elm, black walnut, sycamore and other large species. Intermingled among the latter were patches of smaller species. The forest was full of open areas, little jungles and canopied spaces, and what a place it was for picnics, for camp meetings, and for Chautauquas that lasted a week.

Man-made parks should contain all the characteristics of a virgin forest, and much more. Some do have them. Many small town parks occupy only a city block and some of them are so thoroughly pruned that one may see through them from any point around the outside. If one wants to picnic there no seclusion can be found and the whole country side may see him partake of his corned beef, pretzels and eggnog.

When these parks were established shrubs were planted among the trees. These shrubs now, in many cases, are overshadowed by the trees, are more or less stunted, and leggy and almost leafless. They no longer add beauty, but rather detract from it. They should be removed but no one seems to have the nerve to do so.

It must be remembered that shrubs pass through periods of youth, maturity and old age, and when they reach the latter stage they should be removed and replaced by others. This applies to residence property as well as to parks.



EVERGREENS IN ORNAMENTAL PLANTING

By KATHLEEN MARRIAGE
Colorado Springs, Colorado

IN COLORADO and nearby states that are "high and dry" our ornamental plantings are largely dependent on Evergreens for several reasons. First and most important probably is that we have several months when deciduous trees and shrubs are without leaves, next is that most of the coniferous evergreens whether native or exotic revel in our thin dry air and freedom from danger of waterlogged roots.

Then native vegetation is always a safe guide as to what kind of material will feel most at home in our gardens and look most suitable. In pre-war days when you could drive over hill and plain haven't you noticed how little of the native growth is deciduous in proportion to the area covered by evergreens?

Selection of species and varieties to plant? The size and structure of the house together with the size of the grounds will determine this. For specimen trees to be used as exclamation points, drawing attention to an especially good view or fine piece of architecture, Colorado Blue Spruce and Silver Cedar are tops. However they are too strongly individualistic to agree well in groupings of mixed evergreens. For this the native pines are excellent, western yellow, Foxtail, and Limber Pines for large bold groups and for windbreaks; where smaller scale material is indicated Pinon Pine is better.

White Fir may be used successfully either as a specimen or in groups. It is beautiful in either setting.

One prejudice that seems to

survive is that against the willingness to sacrifice perfection in the individual tree in order to obtain a good group. Anyone who has played football or hockey knows that it's the team that counts, not the individual. A group of pines cannot be a unit if we expect to keep each pine sufficiently far from its neighbor to achieve perfection as an individual.

One trap for amateur gardeners is difficulty in visualizing mature size of the little chaps they are planting now. Thus we see a Blue Spruce or White Fir planted so close to the house that either tree or house will evidently have to be moved if the tree is to have elbow room. It is well to think ten years ahead.

Low spreading evergreens have less individuality and so require less care as to placing. What they do require is pruning in time to prevent unwanted width or height. This is especially true of Junipers Chinensis Pfitzeriana and Sabina. Pfitzers have a way of spreading great mangy looking top wings that give the plant an unwieldy top-heavy appearance. Those who know tell me that this can be forestalled by careful out-of-sight pruning in time.

Sabines' trouble is at the other end. Haven't you seen old horny-legged specimens with just a little fuzz on top? Even these old fellows may be redeemed by cutting back severely about a third of the number of bare stems each year, thus providing foliage ahead for stems about to be cut next year.

So much for conifers. There are few broad leaved evergreens so far that seem to be happy in our

climate, but these few are really valuable helps in ornamental plantings. Two are natives, *Ceanothus velutinus* and *Mahonia* (Berberies) repens, Colorado Holly a half-sister of the taller *Mahonia aquifolium*, Oregon Grape. Both these *Mahonias* are desirable, and effective when planted together, Colorado Holly as a ground cover near Oregon Grape. Both take on the same crimson-to-purple winter color, so warm looking and attractive. Colorado Holly is a tolerant thing, grows equally well in sun or shade, in gravel, peat, loam and even in clay.

Ceanothus velutinus is not easy to establish but is extremely hardy, and useful in a shady corner.

The hardier evergreen members of the *Euonymus* clan are valuable chiefly as climbers, especially in shade where winter sun can't bleach them. The large leaved *Euonymus radicans* vegetus also makes a good shrub if well disciplined in youth. *Euonymus kewensis* with its tiny leaves and neat ways is a real godsend in the shady parts of the rock garden. *Euonymus radicans colorata's* red winter coat makes a

pleasant variation. This is useful too as a ground cover.

While there is no questioning the value of evergreens in our home plantings there is danger of over-planting them to the exclusion of shrubs. A few years ago there was an epidemic of all-evergreen foundation planting. Nine out of ten new houses looking spic and span proudly boasted a pair of tall narrow junipers or arborvitae standing sentinel by the front door—fixed bayonets (not very inviting, were they?) Then snuggling close all around the foundation was a spotty mixture of every texture and color to be found in dwarf conifers, the whole creating rather a somber effect. The variety, in twig leaf flower and form, of a few well-chosen shrubs could add interest to such plantings and incidentally relieve that smugness.

It promises well for the planting of the thousands of new homes to be built after the war that people generally are becoming conscious of the need for attention to scale structure, form, texture and color of plants to suit buildings, and that there is increasing a popular literature to help them.

BOOK NOTES

“THE BOOK of Naturalists,” an anthology of the best natural history. Edited by William Beebe, Alfred A. Knopf, Publisher, 1944, “The development and growth of natural history are reflected in the writings of many naturalists, from Aristotle to the present day, and the inspiration for these writings comes from interest and love of living animals and plants observed under nat-

ural conditions.”—From the editor's preface.

“Green Cargoes” — the story of the transportation of seeds and plants from their original homes to the four corners of the earth. By Anne Dorrance. Doubleday, Doran & Co., Inc., publishers, 1945 — \$2.00. “Green Cargoes” is a book for students of horticulture as well as for anyone interested in the believe-it-or-not facts of plant life.” A most readable little volume.

ATTRACTING THE BIRDS

By ENID ORTMAN

At "Havenwood," the home of the Ortman south of Englewood, you will find many kinds of birds, in and out of season. Mrs. Ortman certainly has the knack of attracting the birds, and tells us here how we can help the birds in exchange for all that they do for us.—Editor.



HAVENWOOD

A WOMAN once complained to John Burroughs that no birds frequented her garden, to which he replied, "You must first have birds in your heart, Madam, if you would find them in the bushes." And, therein lies one of the secrets of attracting them to your garden. Unless you love them you will not have much success, but then, you probably would not be interested if you did not love them, so we shall proceed from that premise.

There are various degrees and kinds of bird consciousness, from

the benighted individual who kills them for what he considers the fun of it, to the one who loves them for one of the sweetest expressions of the Infinite; and somewhere in between is the one who loves them enough to want them around his home and sets about contriving ways and means of attracting them. Love, in itself, may not be sufficient to turn the trick, but you will not get far without it; and mixed with consideration for their simple material needs, such as food, water and shelter, the results are certain.

Of these needs, shelter comes first, and shelter means trees and shrubs. Birds and trees are natural couplets the same as ham and eggs (when pigs used to grow hams). Deciduous trees of course are the backbone of any garden, but the evergreens give much greater protection to birds, providing snug quarters the year around. The birds that winter with us surely deserve extra consideration for the pleasure they bring through the long bleak winter months.

Because of its dense habit of growth our native Colorado Spruce, lovely in itself, is just about the birds' dream of Paradise. Cats find them extremely difficult, if not impossible to climb, and even hawks are usually stopped short in pursuit of the small bird who darts into their spiny arms. They are indeed an open umbrella, protecting against hail, rain and snow storms; and when the wind is howling high the birds nestle close in the heart of them, riding out the gale in comfort. In view of the foregoing it takes no stretch of the imagination to understand why they are also favorite nesting sites of several species.

The Juniper is a close second for the same reasons, offering in addition, berries which are relished by some birds.

If you are planting to attract birds, don't overlook fruit bearing shrubs and small trees. The list of those which may be grown in our rigorous climate is quite long, and many of the good local nurserymen can supply lists of suitable material. Over a period of eighteen years it has been our observation that all fruiting shrubs and trees are host to the fruit eating birds. The Russian olive ranks high, as do the hawthorns, viburnums and buckthorns. Japanese barberry, wild currants, thimbleberry, cotoneasters and honeysuckles are enjoyed by some kinds of birds. Probably the three fruits most enjoyed by birds (even above tame cherries) are mulberries, elderberries and bird cherries.

We have found that the thorny trees give considerable protection against prowling cats, one of the worst destroyers of bird life. Cat lovers who may have been mildly interested in reading this article are not going to like what follows, so here is warning if they want to spare themselves a brain storm. Be it known, here and now, cats and birds do not mix, except with disastrous consequences to the birds. If you really want birds the cats must go, but in heaven's name don't try to have both. It is cruel to offer inducement to the birds to come only to be made into cat food. Leaving all sentiment out of the question, boiling it down to the cold logic of economics, the cat has less than no rating because it destroys great numbers of birds whose economic value is widely recognized and acknowledged, even by the U. S. Bureau of Statistics which has published many pamphlets on the subject.

Some 90 millions of birds are destroyed annually in the United States by the cat; according to no less an authority than Edward Howe Forebush, who made extensive research into the matter, compiling enough damaging evidence in his book, "The Domestic Cat" to convince the worst skeptic.

Naturally that which attracts desirable birds also brings in the English sparrow, and he can become a real problem; the answer to which is a little .22 calibre rifle, if you live in the country. If you live in town, that is out, and unless you have a yen to see the inside of a nice quiet jail you will find some other way, or just grin and bear them. If you are one of those who consider them something less than a pest, you will probably not mind their taking over your feeding stations, as take over they will. Traps offer effective control where other means are not possible.

Part of the pleasure of feeding birds is selfish, albeit a benign selfishness; so place your feeding stations where you can have full enjoyment of them from your windows.

Keep the color of stations and bird houses neutral, preferably weathered or brown, as birds are decidedly color conscious and seem to prefer old, much used and weathered things, feeling perhaps the same ease in them that we do in old clothes. Even of bird baths in our garden, a very lovely terra cotta surmounted by the "Goose Boy" does not hold half the attraction for the birds that a small dilapidated pool at the very edge of the garden does. Here community bathing goes on all hours of the day in the summer, and even quite frequently in winter when the water is free of ice.

Here at "Havenwood" they are

fed everything from soup to nuts, and few indeed have been the things they would not eat. The menu includes fruit, meat, mashed potatoes, sweet potatoes, glazed carrots, cottage cheese, corn bread, muffins, biscuits, preserves, pie, cake, doughnuts and cookies. Most everything to demi-tasse, and with some coaxing they might even take that. All this with a reckless disregard for rationing and the OPA—the daring little beggars. It would be no more surprising to see a bird drink coffee than it was to find an Audubon hermit thrush eating cottage cheese with obvious relish. Once he got the taste of it he came back daily for the feast during the migration stop-over.

The piece de resistance to all the birds which visit the feeding stations is corn bread. They even feed it to their young in season; regurgitated in some instances, or as it comes from the pan in others. Most of the baby robins, Brewer's black birds, finches, orioles and others are practically finished off on it. We make it with sour milk or buttermilk with soda for leavening and shortening added; much as for our own table, except for the eggs. Suet, of course, is a regular, and a large chunk fastened to a tree trunk will furnish you, as well as the birds, much pleasure. Here again the cat enters the picture, for unless you want your suet to mysteriously disappear overnight you will have to fasten rabbit wire over it. The birds have no difficulty feeding through it but it presents a real problem to Tabby.

The staple food we prepare is ground dry bread mixed with what fat can be collected, melted and poured into the crumbs. Then all cooked meat scraps ground and added along with millet, hemp and finely ground corn or wheat. (They like most any grain

which is fine enough so that they can eat it.)

If you want to see a finch smile put some sunflower seeds where he can find them, either in the head or loose. From your point of view it is a bit more fun to watch them dig the seeds out of the head, a trick at which he is most expert.

For an added pleasure to you and convenience to the birds fasten bunches of cotton to a tree. Tear narrow strips of white or faded out light soft rags, cutting them in two or three inch lengths and scatter over the branches of a spruce, if you have one—this of course in nesting season. We have even ravelled out burlap, cutting it into short lengths to avoid tangling the birds' feet. One oriole nest, the framework of which was constructed of this material, became a golden cradle with the sun shining through it.

Once you have succeeded in attracting birds, keep faith with them especially during the late spring snows to which Colorado is subject. Many migrants are coming in at that time and such storms prove real hardships—frequently fatal. Birds will continue to come for feed only where they are not disappointed in times of need.

You may gather from this that it is necessary to own your own home and live in the country to fill all requirements necessary to attract birds, and to a certain extent this might be said to be true, but only as it relates to numbers and those species which avoid cities. It is admittedly the ideal combination, but feed boxes can be found on window ledges high up in many a downtown office building. With a little ingenuity and patience, most any place where there are a few trees and shrubs, plus the earnest desire and effort requisite to success, can be made a bird sanctuary.

DECIDUOUS TREES FOR COLORADO'S PLANT ZONE 4. (DENVER)

ON THE following pages we present the first installment of our report on the statewide tree survey recently taken. We are starting the series with zone 4 because we have had the most reports from this area and also because it is of interest to the greatest number of people. We appreciate greatly the work that many horticulturists all over the state have done in giving us their experience and observations about trees in their zone. Will any others, who did not receive the original check lists, use the list following to check trees which will grow in their zone, and let us know at once so that we may make up later lists with greater accuracy.

The next lists published will be from that zone which has the greatest number of reports in re-

lation to their population. Refer to the March 1945 number for zone map and explanations. Extra copies of the map may be had on application.

As no list such as this is ever final, we urge each reader to let us know of additional trees observed by them, and give us any additional information or corrections concerning the kinds listed here.

For convenience we are dividing each list into groups of those trees recommended and those which MAY grow under favorable conditions. We are also dividing as to small and large trees. Names have been checked with "Standardized Plant Names." "Cl." following a name indicated that it is a clone (Klone) or horticultural variety produced by hybridization or selection. "Sp." indicates species. X indicates hybrid.

CLASS A. THE MOST USEFUL LARGE TREES.

(Most highly recommended 10 in bold face type.)

Acer saccharinum, Silver or **SOFT MAPLE**—A clean and beautiful tree. Of medium fast growth. Has few pests. Likes rich moist soil.

Acer saccharinum, Cl. **CUTLEAF WEEPING MAPLE**—A little more difficult to establish, but makes a beautiful tree of rather "light" effect when given favorable conditions.

Betula pendula, Cl. **CUTLEAF WEEPING BIRCH**—Beautiful, clean, light tree. In a class by itself. Difficult to establish and sensitive to severe drouth.

Celtis occidentalis, **COMMON HACKBERRY**—A slow-growing, drouth-resistant tree. Difficult to establish and sometimes has leaf galls. Survives storms and attacks of pests.

Fraxinus americana, **WHITE ASH**—A stiff "heavy" tree. Slow growing and will stand much abuse.

Fraxinus pensylvanica lanceolata, **GREEN ASH**—Preferred by most horticulturists to other species of ash. Other species of ash, than these mentioned, have been found here, but they are very similar and difficult to identify.

Gleditsia triacanthus, **HONEYLOCUST**—Probably the best all-round tree for this area. A little hard to move and slow to grow, but will survive under difficult conditions. The species has large compound thorns, but there is a thornless variety which is preferred by many. Tiny flowers and large seed pods. Is not subject to attack of borers.

Gymnocladus dioicus, **KENTUCKY COFFEETREE**—Deep rooted and slow growing. Makes a nice shaped tree of bold appearance.

- Juglans nigra*, **EASTERN BLACK WALNUT**—Deep-rooted, slow growing and of bold appearance. Bears edible nuts. Should be moved when small.
- Populus acuminata*, Lanceleaf or **SMOOTHBARK POPLAR**—Of neat and clean appearance and rather upright growth.
- Populus sargentii*, Plains Poplar or **WESTERN BROADLEAF COTTONWOOD**—The most distinctive native tree of this area. Must have plenty of room as it soon grows large and spreading. Grafts or cuttings from male or staminate trees should be used to start all cottonwoods to avoid the objectionable cotton.
- Quercus macrocarpa*, **BUR OAK**—A sturdy bold tree. Of slow growth, but tolerates our soil better than other oaks.
- Tilia americana*, **AMERICAN LINDEN**—One of our most beautiful trees in leaf, bark and shape. Has tender bark, so should be protected for some time after transplanting.
- Ulmus americana*, **AMERICAN ELM**—Our most common shade and street tree. Must be regularly sprayed to control elm scale, and sometimes is bothered by aphids, but still is one of our best trees. Has many good named varieties, such as Wheatley, Vase, Cheyenne, Montana.
- Ulmus americana*, Cl. **MOLINE ELM**—A narrow vertical form which seems to be our best substitute for the upright poplars.
- Ulmus procera*, **ENGLISH ELM**—More upright and symmetrical than the American. Less subject to breakage but sometimes sends up suckers from the roots. Subject to attacks of elm scale.
- Ulmus thomasi*, **ROCK OR CORK ELM**—Similar to above but with corky bark.
- Ulmus (americana X pumila)* **HYBRID ELM**—Of variable habit but usually combines the sturdiness of the American with the rapid growth of the Siberian. If the type could be fixed this would be the best tree for Colorado.

CLASS B. LESS USEFUL LARGE TREES.

(Some because of lack of "hardiness," some because of attacks of insects and diseases, and some because of inferior habit of growth.)

- Acer negundo*, **BOXELDER**—Short lived native tree. Useful where nothing else will grow. Susceptible to damage by insects and diseases, and of ragged appearance when older.
- Acer platanoides*, **NORWAY MAPLE**—Difficult to establish and subject to sunscald, but with favorable conditions it makes a fine tree.
- Acer platanoides*, Cl. **SCHWEDLER MAPLE**—Leaves red in spring. Very beautiful but slow growing and hard to establish.
- Acer pseudoplatanus*, **PLANETREE MAPLE**—Difficult as two above.
- Acer saccharum*, **SUGAR OR HARD MAPLE**—Similar to three above.
- Aesculus octandra*, **YELLOW BUCKEYE**—A beautiful tree in flower, leaf and form. Deep rooted and slow growing. Seedlings from trees which have survived here are better.
- Betula papyrifera*, **PAPER BIRCH**—Has only been tried by a few, but has been rather successful in most places.
- Betula pendula*, **EUROPEAN WHITE BIRCH**—Seems to be more difficult than the cut-leaf form. Subject to borers and disease.
- Catalpa speciosa*, **NORTHERN OR WESTERN CATALPA**—Loved because of its beautiful flowers, large leaves and picturesque seed pods. Hated for its dropping flowers, pods and leaves. Has irregular habit of growth and winterkills to the ground often when young.
- Juglans cinerea*, **BUTTERNUT**—Extremely slow growing and difficult to become established.
- Morus alba tatarica*, **RUSSIAN MULBERRY**—Birds prefer the fruit to cherries. Is subject to sunscald and is always full of small dead twigs. Short lived here but worthwhile.

- Platanus occidentalis*, SYCAMORE OR AMERICAN PLANETREE—Slow growing and kills back frequently when young. When established it makes a beautiful large tree.
- Populus alba*, Cl. BOLLEANA POPLAR—Has been the most popular of the columnar type poplars but is hardly worthwhile planting now as it is susceptible to borer and blight damage. As with all poplars it is a rank feeder and robs surrounding areas of food and water.
- Populus alba*, Cl. SILVER POPLAR—Often wrongly called "Silver Maple" because of the maple shaped leaves. Light green smooth bark and of large spreading habit. Will grow where few other trees will survive. Sometimes suckers from the roots.
- Populus andrewsi*, ANDREWS POPLAR—A natural hybrid of the lanceleaf and broad leaf cottonwoods, discovered by Mr. D. M. Andrews. Should be a useful type of cottonwood for country places.
- Populus angustifolia*, NARROWLEAF POPLAR—Will grow here but chiefly valuable at higher altitudes.
- Populus balsamifera*, BALSAM POPLAR—A native from higher altitudes. Will grow here but not as good as others.
- Populus canadensis eugenei*, CAROLINA POPLAR—Extensively planted a few years ago. Furnishes quick shade but soon begins to go bad. Native cottonwood is better.
- Populus nigra*, Cl. LOMBARDY POPLAR—The familiar upright poplar of old gardens. Subject to attacks of scale and diseases.
- Populus simoni*, CHINESE OR SIMON POPLAR—Of upright shape similar to Bolleana and Lombardy. Some think it is better, but it still has all the faults of the poplars.
- Prunus serotina*, BLACK CHERRY—When established it makes a tall clean tree. Tender bark and difficult root system makes it hard to move when large.
- Quercus alba*, WHITE OAK—Very slow growing and hard to move.
- Quercus coccinea*, SCARLET OAK—Requires a rich, slightly acid soil. Very beautiful especially in fall color.
- Quercus falcata*, RED OAK—Difficult but beautiful when established.
- Quercus palustris*, PIN OAK—As with all of the black oak type, this one does not like our soil, but when conditions are suitable it makes a beautiful tree.
- Quercus robur*, ENGLISH OAK—A few specimens have become established around Denver and are doing well.
- Robinia pseudoacacia*, BLACK LOCUST—A tree once planted extensively because of its hardness, valuable timber and beautiful flowers. Is not worthwhile planting in most places now because of attacks of borers.
- Salix alba*, WHITE WILLOW—All the willows are rank feeders and will choke out adjoining plants and stop up sewer lines. Most are short lived and subject to storm damage.
- Salix alba vitellina*, YELLOWSTEM WILLOW—Striking for its winter color.
- Salix babylonica*, BABYLON WEEPING WILLOW—A striking weeping kind.
- Salix babylonica*, Cl. GOLDEN WEEPING WILLOW—The most beautiful of the willows. Planted by water in large grounds it is very effective, but it is too rank a grower for most city yards.
- Salix blanda*, WISCONSIN WEEPING WILLOW—Similar to above but green barked.
- Salix lasiandra*, PACIFIC WILLOW—The large willows naturalized years ago near Boulder have been identified as this species.
- Salix nigra*, BLACK WILLOW—A native tree of stream banks.
- Tilia europaea*, EUROPEAN LINDEN—More tender barked than the American, but usually a better shape. A beautiful tree.
- Ulmus fulva*, SLIPPERY ELM—Kills back often but a few have become large trees.
- Ulmus glabra*, SCOTCH ELM—Nice shape but not as adaptable as the American.
- Ulmus pumila*, CHINESE OR SIBERIAN ELM—Has been our most popular elm for several years, but is losing favor because of its breakage in storms. Grown slowly under dryland conditions it makes a good tree. With irrigation it grows very rapidly and must be carefully trimmed each year to avoid storm damage.

CLASS C. THE MOST USEFUL SMALL TREES

(The ten best in bold face type)

- Catalpa ovata*, **CHINESE CATALPA**—Interesting and beautiful tree.
- Crataegus coloradensis*, **COLORADO HAWTHORN**—Slow growing but long lived. Beautiful in flower, fruit and foliage.
- Crataegus crusgalli*, **COCKSPUR HAWTHORN**—Distinctive low, round-headed shape. Dark red fruit, small but numerous and hang on all winter.
- Crataegus mollis*, **DOWNY HAWTHORN**—Good as a tall shrub or single-stemmed tree. Large red fruit in fall.
- Crataegus phaenopyrum*, **WASHINGTON HAWTHORN**—Nice shape and leaf. Good for Colorado.
- Crataegus saligna*, **WILLOW HAWTHORN**—A native species with black fruit and narrow leaves.
- Elaeagnus angustifolia*, **RUSSIAN OLIVE**—A tree with picturesque habit of growth and attractive silver leaves. Useful for foliage contrasts. Very hardy and adaptable to many uses.
- Malus* sp. Cl. **DOLGO CRABAPPLE**—White flowers and brilliant red apples which are as good for jelly as they are good to look at. One of the hardest and blight resistant. Good to use for espallier.
- Malus* sp. Cl. **HOPA CRABAPPLE**—One of Prof. Hansen's best developments. Beautiful rose-red flowers. Fruit very small. Narrow upright habit of growth. Very hardy and blight resistant.
- Malus purpurea* Cl. **ELEY CRABAPPLE**—Light rose-red bloom. Somewhat similar to Hopa but more spreading habit of growth. Quite hardy.
- Malus ioensis*, **PRAIRIE CRABAPPLE**—The parent of the Bechtel. Single light pink flowers which fall when faded. Variable in habit but always beautiful.
- Malus ioensis* Cl. **BECHTEL CRABAPPLE**—When in full bloom the large double light pink flowers almost cover the tree. No fruit. The faded petals hang on for a long time making a dirty effect.
- Malus* sp. Cl. **RED-SILVER CRABAPPLE**—Leaves green above and red silvery below. Very attractive rose-red bloom and large fruit.
- Prunus americana*, **AMERICAN PLUM**—A shrub or tree of low rambling habit. Beautiful in flower and sometimes bears good fruit. Very hardy and useful for thickets and backgrounds.
- Prunus cerasus* var. **SOUR CHERRIES**—The variety Montmorency, in particular, makes a beautiful low-headed tree. Flowers are nice and fruit is very useful.
- Salix amygdaloides*, **PEACHLEAF WILLOW**—A low native willow for moist places where other trees will not grow.
- Sorbus aucuparia*, **EUROPEAN MOUNTAIN ASH**—One of the most attractive small trees for use in Colorado. Neat appearance with rather vertical habit. Heads of white flowers and very attractive orange-red fruits. Tender bark of trunk must be shaded when young.
- Syringa japonica*, **JAPANESE TREE LILAC**—A clean small tree of slow growth and very hardy. Large heads of creamy white flowers.

CLASS D. LESS USEFUL SMALL TREES

- Aesculus glabra*, **OHIO BUCKEYE**—A tree hard to establish, but of beautiful shape and very attractive in flower.
- Aesculus hippocastanum*, **COMMON HORSECHESTNUT**—More attractive bloom and shape than the Buckeye, but not as easily established.
- Alnus glutinosa*, **EUROPEAN ALDER**—Only a few trees have been successful here.
- Aralia spinosa*, **Devils Walking Stick** or **HERCULES CLUB**—Large prickly stems and very large doubly compound leaves. Kills back frequently.
- Carya* sp. **HICKORY**—Very difficult but a few have managed to survive in this area.
- Catalpa bignonioides*, Cl. **UMBRELLA CATALPA**—A small formal tree. Likely to winterkill in bad seasons.

- Cladrastus lutea*, AMERICAN YELLOWWOOD—Uncommon tree here, but is hardy in some locations.
- Crataegus oxycantha*, ENGLISH HAWTHORN—Beautiful cut leaves, white flowers and red fruit. Most subject to blight.
- Crataegus oxycantha*, Cl. PAULS SCARLET THORN—Very attractive double red flowers, when it does bloom, but subject to blight and difficult to establish.
- Fagus sylvatica*, EUROPEAN BEECH—A beautiful tree in the east but most unhappy in our soil and climate.
- Ginkgo biloba*, GINKGO—The most ancient of trees. Usually very difficult and unhappy here.
- Koelreuteria paniculata*, PANICLED GOLDENRAINTREE—Kills back frequently, but once established makes a wonderful show of flowers and fruit.
- Liriodendron tulipifera*, TULIPTREE—There have been many attempts to raise this tree, with a few successes.
- Malus arnoldiana*, ARNOLD CRABAPPLE—A beautiful tree but difficult here.
- Malus atrosanguinea*, Cl. CARMINE CRABAPPLE—Beautiful in the east but not dependable here.
- Malus baccata*, SIBERIAN CRABAPPLE—Has been considered a dependable tree for fruit and flowers, but lately has been badly damaged by blight.
- Malus floribunda*, JAPANESE FLOWERING CRABAPPLE—Subject to blight and difficult to grow here.
- Malus halliana*, Cl. PARKMAN CRABAPPLE—Usually unreliable here.
- Malus hupehensis*, Cl. TEA OR ROSE CRABAPPLE—Rose-pink blossoms changing to white.
- Malus pumila*, Cl. NIEDZWETZKYANA CRABAPPLE—The Redvian Crab. Usually hardy and attractive here.
- Malus scheideckeri*, SHEIDECKER CRABAPPLE—Not very reliable here.
- Morus alba*, Cl. WEEPING MULBERRY—A formal "upside-down" tree. Frequently kills back.
- Populus tremuloides*, QUAKING ASPEN—A beautiful native but is difficult to transplant and very subject to attacks of scale.
- Salix pentandra*, LAUREL WILLOW—Attractive glossy leaves. Has all the faults of other willows.
- Sophora japonica*, JAPANESE PAGODATREE—Attractive leaves and flowers. Several are established in Denver parks.
- Sorbus americana*, MOUNTAINASH—A beautiful tree when established. Subject to sunscald and blight.
- Sorbus hybrida*, OAKLEAF MOUNTAINASH—Similar to European mountainash but has entire leaves.
- Tilia cordata*, LITTLELEAF LINDEN—Some think that this is the best of the lindens, but it is not well known.
- Xanthoceras sorbifolium*, Shingleleaf Yellowhorn or CHINESE CHESTNUT—Attractive flower, fruit and foliage. Somewhat like sumac or mountain ash. Several are well established in Denver parks.

CLASS E. USEFUL TALL SHRUBS, SOMETIMES TRAINED AS TREES

- Acer ginnala*, AMUR MAPLE—Nice small tree with brilliant red fall color.
- Acer glabrum*, ROCKY MOUNTAIN MAPLE—Makes a nice hardy small tree.
- Alnus tenuifolia*, Thinleaf or MOUNTAIN ALDER—Easily trained as a tree. Very hardy and attractive.
- Betula fontinalis*, Water or ROCKY MOUNTAIN BIRCH—Beautiful cherry-like bark. Makes a neat and hardy tree.
- Caragana arborescens*, SIBERIAN PEASHRUB—Fine foliage and small yellow flowers. Very hardy and drought resistant.
- Crataegus intricata*, THICKET HAWTHORN—When trimmed to a single stem it makes an attractive small tree.

Euonymus europaeus, **EUROPEAN EUONYMUS**—Attractive orange and red fruit hangs on late. Usually quite hardy.

Hippophaea rhamnoides, **COMMON SEABUCKTHORN**—Easily trained as a tree. Attractive gray leaves and orange fruit.

Maclura pomifera, **OSAGEORANGE**—Drouth resistant but winterkills in exposed places.

Prunus americana, **Cl. NEWPORT PLUM**—A striking red-leaf variety. Small pink flowers and edible fruit.

Prunus pennsylvanica, **PIN CHERRY**—Easily trained as a tree. Attractive in flower and fruit. Birds enjoy the fruit.

Prunus virginiana demissa, **WESTERN CHOKECHERRY**—Attractive fragrant flowers and useful fruit. Suckers from the roots.

Rhamnus cathartica, **COMMON BUCKTHORN**—Very hardy. Black fruit.

Rhus typhina, **STAGHORN SUMAC**—Easily trained as a tree. Very easy to grow, but shallow-rooted and short-lived. For quick temporary effects.

Shepherdia argentea, **SILVER BUFFALOBERRY**—Small gray leaves and bright red edible fruit. Root suckers.

Syringa villosa, **LATE LILAC**—The tree-form specimens west of the Cheesman memorial in Denver have attracted a great deal of interest.

Viburnum lentago, **NANNYBERRY VIBURNUM**—When trained as a tree it is very attractive. Good flowers and fruit.



Plan by S. R. De Boer

Picture by S. R. De Boer

LANDSCAPE ARCHITECTURE FRAMES A PICTURE IN A GARDEN

AN IMPORTANT function of landscape architecture is to protect and enhance existing beauty.

The residence of Mr. and Mrs. Delos Chappell, on the Morrison Road, faces Mt. Evans, and has vistas to the 200 mile range of the Rockies. Their garden has been designed to give the maximum effect of this thrilling and beautiful picture.

The cut illustrates the view from the dining room over Bear Creek Valley. Long lines of foliage frame the view and the vista has been narrowed to increase the effect. The balustrade at the end completes the frame. Inside the garden there are a series of pools and flower planting along each side, with small beds to the right and left for cut flowers.

The Colorado Arboretum

TWO very interesting and instructive articles relating to the formation of arboretums were published recently. In the **Saturday Evening Post** for April 14th the story of the formation of the Arthur Hoyt Scott Arboretum at Swarthmore College was related, and on May 18th Dr. Donald Wyman devoted 23 pages of **Arnoldia** to "The Park Arboretum—How To Establish One As A Living Memorial." (**Arnoldia** is published by the world famous Arnold Arboretum of Harvard University.)

Ever since its first issue, the **Green Thumb** has been stressing the imperative need of an Arboretum or Botanical Garden for this area. Some of the functions of a Park Arboretum, as stated by Dr. Wyman, are:

- "1. To grow 'the best' woody plants hardy in the area in order that home owners may become acquainted with their names, their ornamental characteristics and the proper methods of culture.
- "2. To show a **complete selection** of all that is considered the best from an ornamental standpoint among the woody plants that it is possible to be grown in the area.
- "3. To serve as a means of **introducing** new woody plants into the area, regardless of the source from which they may come.
- "4. To disseminate a knowledge of woody plants to the public. This would include information on culture, pruning, fertilizing and possibly a continual study under local conditions of just what varieties are 'the best,' including even cooperation with schools, garden clubs and other organizations.
- "5. To test the hardiness of untried varieties.
- "6. To provide an out of doors laboratory for students of botany, horticulture and nature study.
- "7. To increase the productivity, economic importance and beauty of an area, by intelligent and interesting planting, and by introducing plants not grown there before.
- "8. To provide recreational stimulus to the public by means of walks, drives and beautiful displays, and to stimulate the pleasure of learning to know new plants which might be adapted to planting on private property.
- "9. To serve as a 'Permanent Living War Memorial,' beneficial to the people living in the area and attractive to visitors from outside the area."

It is hoped that both of these splendid articles have come to the attention of our readers. Mr. L. C. Shoemaker (our officer manager) has a limited supply of reprints which he will furnish to interested persons as long as they last.

There will never be as opportune a time as the present to commence such a project in Colorado. More and more are people favoring beautiful **Living** Memorials over cold marble and stone.

The Swarthmore College Arboretum was made possible by an endowment of only one hundred thousand dollars. The great Park Arboretum in Rochester, New York, started with a gift of 484 acres to the city, which has maintained the area ever since. Shall we not **complete** Colorado's preeminence in this general field, by adding to our Natural History and Art Museums, a suitable Arboretum of the **living** Colorado treasures!

The Green Thumb

September - October — 1945



~~~~~ THE GREEN THUMB ~~~~~

A Bulletin of the

COLORADO FORESTRY AND HORTICULTURE ASSN.

Organized in 1884

George W. Kelly, Editor

L. C. Shoemaker, Office Manager

Room 14, 1608 Broadway — Phone TAbor 4673

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"To preserve the natural beauty of Colorado; to protect the forests; to encourage proper maintenance and additional planting of trees, shrubs and gardens; to make available correct information regarding forestry, horticultural practices and plants best suited to the climate; and to coordinate the knowledge and experience of foresters, horticulturists and gardeners for their mutual benefit."

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VOLUME II

NUMBER 5

ANNUAL OUTING

After the very successful outdoor meeting and picnic at City Park last summer, it was decided to make this an annual event. This year the meeting place will be beautiful Lake Junior High School, with its matchless view over Sloan's Lake to the Continental Divide.

A picnic supper will be brought by all at 5:30 p. m. Tuesday, September 11th.

After eating supper Messrs. George Kelly and M. Walter Pesman will exhibit and explain the interesting and unusual selection of plant material there which they layed out for the School Board.

Then a "premiere" showing of the kodachrome film "Wild Life," by the United States Forest Service will be given in the auditorium. This is truly a marvelous picture which hasn't been shown to the public in Denver before.

Mr. Robert Niedrach of the Colorado Museum of Natural History will talk on a subject (horticultural) to be announced later.

The school authorities have graciously given us permission to use the school lunch room in the event the weather is inclement.

Bring all the guests you wish.

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A TWO YEARS' SUBSCRIPTION FOR THE PRICE OF ONE!

New members can get a two years' subscription to the **Green Thumb** for the price of one, according to recent action taken by the Board of Directors of the Colorado Forestry & Horticulture Association.

In order to encourage new memberships, any new subscription received prior to January 1, 1946, will receive, **gratis**, the November, 1945, issue, and so long as they last, **all previous 1945 issues**, and the **Special Lilac Issue of 1944!** (We have several hundred of these back numbers, so get your new subscription in **early**, so as to be sure to get all the 1945 issues.)

Let's all **give** at least one new membership to a friend! **And**, let's all **sell** at least three home gardeners on a new membership!

Picture on front cover is *Quercus muehlenberg*, **YELLOW CHESTNUT OAK**,
in Chatauqua Park, Boulder, Colorado.

AUTUMN COLOR

MRS. M. J. WEBBER

SINCE blossom time the little old plum tree, looking out from under the branches of the Blue Spruce, has gone unnoticed, until, in early September, its gay red leaves beckon to say we are at the threshold of another Autumn. The Alert Signal!

This season, which is known as Autumn, covers approximately, so far as colors are concerned, the months of September and October—the season of warm days and cool nights.

With the beginning of coloration in the plums, the changes come rapidly, and if we would enjoy to the utmost this colorful season, it is time to begin our fall pilgrimages. Thoreau once said he traveled a good deal, mostly about Concord. We too, travel a good deal, but our travels do not take us far afield. It is fortunate that none of us need go much beyond our own doorstep to enjoy some of the loveliest scenes which nature has provided.

As the hours and the days pass, each path and highway is bordered with color—not all vivid—but a change from summer's green. Purples and reds, yellows and browns; from ground covers to grasses, to Cat-Tails, to Willows and Cottonwoods. The fences and hedgerows are draped with Ampelopsis and clematis and wild cucumber.

However, some pilgrimages are directed to shrines of special significance.

Knowing the habits of the Ginnala Maples, they come early on our list and we give them preferred attention. Following a devious path for some distance, we are not disappointed, for through the intervening growth we glimpse them, arrayed in all their

glory! From bronzy red to wine—all equally vivid. One of the sensations of the year!

Because of the rapidity of change, it is difficult to follow in sequence.

One can hardly omit Sumacs (*Rhus*) in speaking of color. They are omnipresent, in variety, and add much to the brilliancy of our Autumns.

Viburnums in general form one of our best sources of colored foliage.

The fruit of *V. Lantana* commands early attention as it changes from green to white to red to black—where it remains as an accent when the foliage changes to varying shades of red.

We would detour not to miss *V. Cassinoides*, when its white veined leaves are variegated red and green and the clustered fruit is pink.

V. Lentago is second only to the Ginnalas in its brilliance and volume of color.

Though the change occurs later, mention of Viburnums in connection with autumn color would be incomplete without *V. americanum*, the Cranberry of our gardens. The fruit ripens early and remains in place throughout the winter, as it is not to the liking of the birds. On the sunny side, the leaves show the usual bronzy reds, but in the protected locations they vary from delicate pink to rose. There are other plants—such as *Viburnum molle* and *Kolkwitzia* which produce good fall color in shades of pink, but nothing else gives quite such good pinks as the Cranberry. They are clear and varied in tone—less interrupted by the veining.

Berberis Thunbergii gives us a true red in both leaf and fruit—

the latter remaining in place throughout the winter.

Evonymus in variety, but especially *alata*, should be mentioned. The latter assumes a color close to *cerise*.

Ptelia trifoliata has an attractive leaf, and becomes a clear, bright yellow.

Spiraeas are not always considered as autumn subjects. *Van Houttei* is universally planted for its abundance of white flowers in spring, but in October the bush is of a rich coloring—yellow to mahogany.

Though frost may prevent the freedom of flowering of *S. prunifolia*, its later gown of red satin warrants its presence in the garden.

S. Thunbergii too is an early bloomer, but the tomato red of its feathery foliage is one of the last bits of color we see before freezing weather.

While shrubbery is invaluable, for landscape, for background, for mass effect, we must turn to the trees.

As we look across the fields, the pure gold of the Cottonwoods lends character to the scene. If there were nothing else, it would be a noteworthy landscape. But there is so much beside.

The Cottonwood's near relative, the Aspen — the tangible gold of the foothills. And the Birches and Willows in variety.

However, not a few of our trees in cultivation have been grown in sufficient numbers to give an appreciable effect.

The Hawthorns — *Crataegus coccinea*, var. *mollis* is one of the most decorative in foliage and fruit, *C. crus-galli* is of distinctive habit of growth, orange to scarlet in color, with small, darker red fruit — as a whole they are valuable decorative subjects.

We owe much to the Maples. They are beautiful at all times, but as the color changes, each

species has something special to commend it.

As these trees assume their brilliant hues we make some of our most enjoyable pilgrimages.

Our steps turn instinctively to that lovely spot where the drooping branches of the American Birches, with their tiny, restless yellow leaves, partially conceal the bright colors of the Sugar Maples growing among them.

If from the top of the hill we see color among the maples below, we walk down through the aisles of the tiny grove, looking to see the sun shine through the vaulted ceiling. The walls and the carpet are of such colors as only the Sugar Maple can produce.

Frequent visits are made to the Norway Maple grove—from the time the first trace of yellow appears. Each day we note the effect of the recession of the chlorophyll until it has disappeared entirely and the leaf becomes pure yellow. Some of the trees produce leaves of creamy white and from that to a fairly bright yellow. A few have leaves of a pale, slightly mottled pink. The foliage is dense and deliberate in falling—making a thick carpet at the end of the season.

In early October we commence to take note of the Oaks. Because of the number of species and the tendency to individuality among the trees, the period of coloration is prolonged. The trees vary greatly in color—from light reds to dark shades, and they are of such substantial texture that they retain their appearance for some time. From the time the first Oak begins to assume its brilliant dress to the close of the season is a period of weeks of uninterrupted beauty.

When all of the leaves have fallen it is like the rolling away of a curtain—the mountains come into view and the winter etchings appear.

GROWING CHRYSANTHEMUMS IN COLORADO

MRS. L. L. JOHNSON

WHEN we first started gardening many years ago we grew several varieties of chrysanthemums which a friend brought to us from the South. They were winter hardy, multiplied and grew like weeds into fine strong plants. The only trouble was that they did not bloom until Halloween and were nearly always ruined by a snow and freeze before they reached their full beauty.

We always salvaged great armloads of the blossoms, trying to select those not too badly damaged by frost. They were more precious to us than the flowers of midsummer for it seemed that we were miraculously given an extra bit of summer after winter had taken over. But we always wished that our chrysanthemums could bloom two or three weeks earlier so that we might see them in their full beauty unmarred by frost and snow.

So it was with a good deal of interest that we began hearing about the new early-blooming chrysanthemums — of the azalea-mums that began blooming in August and of the Korean hybrids that were being introduced by Mr. Alex Cumming.

Several American and European plantsmen had worked for years to improve greenhouse chrysanthemums but no one had ever given a thought to chrysanthemums for the garden. Most if not all chrysanthemums grown in gardens were originally greenhouse varieties. Many of these were perfectly winter hardy but were unsuited for garden use in other important ways. They bloomed too late to escape freez-

ing weather. They grew too tall and top heavy, so were easily blown over and broken in fall storms. They set too many buds and required expert disbudding and training to produce acceptable sprays of good sized flowers. Flowers and foliage were too easily damaged by light frosts.

Mr. Alex Cumming, recognizing these faults of greenhouse chrysanthemums for garden use, was the first seriously to turn his attention to the development of good garden varieties. He succeeded in producing a strain much better adapted to garden conditions. These chrysanthemums became known as the Korean Hybrids. The use of the Korean Daisy and later of the Arctic Daisy gave the group greater winter hardiness, earlier blooming, more frost-resistant flowers and foliage and new brilliant, sparkling colors. Among the dozens of these hybrids that have been introduced, Lavender Lady is one of the most famous. Mrs. P. S. Du Pont, Eugene Wander, Burgundy and Red Velvet are other fine ones.

Many others have followed the lead of Mr. Cumming and are working today to improve garden chrysanthemums. The University of Chicago has introduced a strain famous for winter hardiness. Polar Ice, Robert Brydon, and Barbara Small are among the first introductions in this group. The University of Minnesota is working for earliness of bloom and winter hardiness. We consider Chippewa and Red Gold their best varieties. Mr. De Petris of Grosse Point, Michigan, has developed plants with especially healthy, frost-resistant foliage.

Most of these new introductions can be grown satisfactorily in the

Denver area. The ideal chrysanthemums for Colorado must first of all be early blooming. They should be in full bloom by October 20. Many people plant only those varieties that come into bloom in September thinking that these will more surely escape the hard frosts. It has been our experience that those in full bloom in late September are often blighted by the first hard frost which usually comes about the first of October. Those that open their buds a little later enjoy the benefit of the Indian Summer lull which follows the first killing frost. Another advantage of later blossoms is that colors are deeper and more brilliant when the sun's rays are not so strong.

Chrysanthemums for Colorado should be of low or medium height—from one and one-half to two and one-half feet. Taller varieties require staking and even then nearly always are broken by our fall winds or perhaps an early snowfall.

Our chrysanthemums must be fully winter hardy and have foliage and flowers that can withstand successive light frosts. Most chrysanthemums can take lower temperatures than we ordinarily have but our plants must be able to stand long winter months with little moisture. Often the lack of a snow cover causes alternate freezing and thawing which only the hardiest chrysanthemums can survive.

We will now discuss some of the varieties that measure up to these requirements to some degree. None of them are perfect in all respects. But all the varieties we mention have been in our garden at least one winter and we have had many of them for several years.

The azaleamums or cushion mums are very popular. Their low mound habit of growth, profusion

of flowers and long period of bloom make these suitable for borders, massing in front of evergreens and other landscape uses. Many colors are obtainable. More and more of the new introductions in recent years are of the cushion type.

There are so many fine varieties among the taller, larger flowered group that we can mention only a few favorites. Among the whites Silver Moon is the most frost resistant. It is a large semi-double showing a yellow center. It has an unusual nut-like fragrance that is very pleasing. It is a wonderful cut flower. Avalanche is a new white that flowers in lovely graceful sprays. September Cloud and Boreas are two good whites that bloom early enough to escape frosty nights.

Many of the pinks carry lavender tints. Pohatcong is an old favorite and Lavender Lady is one of the finest mums grown. Jean Treadway is a real pink with a wine colored center. It is a little tricky to grow into a nice plant. Early Wonder is a very delicate ball-shaped pink. Mrs. P. S. Du Pont is a wonderful peach pink and Peachblow is a semi-double of much the same color.

Chrysanthemums that bloom in the true autumn colors — rich bronzes, reds and yellows seem especially to fit the season. Fine bronzes include Indian Summer, Cydonia, Ember, Ruth Cumming, September Bronze and Goblin. Red Velvet and Ruby Pompon are good reds. Burgundy and The Moor are wine shades that are lovely but they are not reliably winter hardy with us. Good yellows are Algonquin, R. Marion Hatton, King Midas and Yellow Dean Kay. I should like to include Eugene Wander among the yellows for it has fine large blossoms that open early and a nice habit

of growth, but it definitely is not winter hardy here.

Among the new types the Spoon Chrysanthemums are of interest. The petals of these flowers are long slender tubes that are flattened at the tip in a spoon shape. White Spoon and Orchid Spoon are especially appealing.

The Northland Daisies are singles in many brilliant colors. They make fine garden plants and are very hardy. Brunhilde with lovely peach-colored blossoms made a fine showing in our garden last fall.

The new English chrysanthemums are being much talked about. They are said to have come from England by way of Canada to growers on the Pacific coast. They are gradually being distributed over the country. This race of mums has much larger flowers than other garden chrysanthemums. They have a very early blooming habit, many of them opening in August and September. They vary greatly in winter hardiness and frost resistance. A good deal of experimentation and selection remains to be done to find those varieties that are suited to our section.

Just a few words about the culture of chrysanthemums may not

be amiss. They are not too difficult to grow to perfection but their requirements must not be neglected.

Chrysanthemums need a very rich soil. Plenty of barnyard manure should be dug in each spring. In addition we find it beneficial to give each plant about a tablespoonful of commercial fertilizer once or twice a season to keep it growing continuously. The plants should be watered thoroughly every week or ten days and cultivated after each watering.

The clumps should be divided and reset every spring. If it is not convenient to do this some of the plants or stools should be removed from the clump so that those remaining will have a chance to develop.

It is advisable to pinch back tall growing varieties early in the season to make them grow into stocky, bushy plants.

After many years of growing chrysanthemums we are convinced that no other flower can give the gardener more satisfaction. Early and late varieties give a long season of bloom in a fine color range and there are types to fit any spot in the garden. Best of all to keep up interest there are dozens of new introductions every year.

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Maybe, some day, plants will receive a horticultural classification indicating the conditions and locations under which and where they will thrive best, but even so there will always be those who like to do their own experimenting and see if they can get a *Gardenia florida* to survive the winter. So maybe it is the customer who ought to be classified and not the plants.—ERNEST HEMMING, in "Am. Nurseryman."

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"The greatest fine art of the future will be the making of a comfortable living from a small piece of land."—Abraham Lincoln.

TREES FOR ZONE 5

(Boulder, Fort Collins, Loveland, Greeley)

OUR survey shows that all of the trees listed previously for zone 4 are equally suitable for this zone. Below are listed a few trees that should be added to the zone 4 lists. These are also suitable for most of zone 5.

Lists "A" and "C", recommended trees for zone 4, also apply to zone 5. The added trees below are all in the "will also grow" classes.

Additional Trees For Zones 4 and 5.

Class B. Less Useful Large Trees.

Acer saccharinum, Cl. Skinners Maple—A weeping maple similar to Cutleaf weeping maple.

Castanea dentata, AMERICAN CHESTNUT — Very rare, but a few specimens are found in the area.

Fraxinus nigra, BLACK ASH—Occasionally found. Not as hardy as others.

Populus petroskyana, Cl. PETROSKY POPLAR.

Populus alba richardi, Richards WHITE POPLAR — Occasionally found in the area. All the faults of the poplars.

Class D. Less Useful Small Trees.

Acer campestre, HEDGE MAPLE—Neat small tree or larger shrub. A little tender.

Acer tataricum, TATARIAN MAPLE—Similar in growth to *A. ginaala*, but not as good fall color.

Ailanthus altissima, TREE OF HEAVEN AILANTHUS — Different strains show varying degrees of hardiness. Will grow in smoky cities. Where others cannot survive (A tree grows in Brooklyn). Has disagreeable odor. Sometimes make beautiful trees. Suckers from the roots.

Cercis canadensis, EASTERN REDBUD—Small tree or large shrub. Will sometimes survive in these zones and occasionally will surprise you with their beautiful blooms early in spring.

Euonymus atropurpureus, EASTERN WAHOO — Probably the best of the euonymus. Very attractive fruits and fall color. Usually grown as a large shrub.

Juglans rupestris, TEXAS BLACK WALNUT — Rapid growing hardy tree. Nuts are very small.

Robinia neomexicana, NEW MEXICAN LOCUST — Very attractive clusters of pink flowers. Slower growth than black locust. Also bothered by borers.

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"The land — that is where our roots are. There is the basis of our physical life. The farther we get away from the land, the greater our insecurity. From the land comes everything that supports life. The land has not collapsed or shrank in either extent or productivity. It is there waiting to honor all the labor we are willing to invest in it, and able to tide us across any local dislocation of economic conditions. No unemployment can be compared to an alliance between man and a plot of land." — Henry Ford.

TREES FOR BOULDER

BOULDER enjoys unique horticultural advantages which make it possible to grow a larger variety of the fine trees of the east than probably any other place in the state. While the Grand and Arkansas valleys are of lower altitudes and the southern corners of the state have longer seasons these areas generally have other disadvantages which restricts their list of suitable trees.

There is a nice combination of factors which make Boulder's climate so favorable. There are more cloudy hours in the year, more rainfall, more humidity in the air, a less alkaline soil, better drainage, and the tempering and protecting influence from the near-by hills. The list of trees compiled for Denver will all grow in Boulder. In addition to the recommended trees, practically all the "will also grow" trees will not merely survive but will grow quite happily in the town. Most of the oaks, maples and lindens are growing there as well as in the east. There is sometimes a noticeable lack of flowers and fruit due to our late frosts, but the tree itself does fine. In addition to the lists of trees for zone 4 and the additional trees for zone 5 the following trees are found growing in Boulder.

In compiling this list we are very much indebted to Miss Maud Reed, and Dr. Edna Johnson of Boulder and Mr. Edwin A. Congdon formerly of Boulder. Anyone desiring to locate any of these rare trees may obtain a list from these people or the editor.

Acer palmatum, Cl. Bloodleaf variety of JAPANESE MAPLE.

Acer negundo interius, INLAND BOXELDER.

Acer rubrum, RED MAPLE.

Betula papyrifera andrewsi, ANDREWS PAPER BIRCH.

Betula lenta, SWEET BIRCH.

Betula lutea, YELLOW BIRCH.

Celtis douglasi, DOUGLAS HACKBERRY.

Celtis laevigata, (mississippiensis), SUGAR HACKBERRY.

Corylus cornuta (rostrata), Beaked FILBERT—native shrub.

Cornus florida, FLOWERING DOGWOOD—small tree.

Crataegus cerronis, CERRO HAWTHORN—small tree.

Diospyros virginiana, COMMON PERSIMMON.

Fagus grandifolia, AMERICAN BEECH.

Fagus sylvatica purpurea, Cl. PURPLE BEECH.

Fraxinus americana ascidiata, PITCHER ASH.

Fraxinus excelsior, EUROPEAN ASH.

Carya glabra, PIGNUT HICKORY.

Carya illinoensis, PECAN.

Carya ovata, SHAGBARK HICKORY.

Magnolia acuminata, CUCUMBERTREE MAGNOLIA.

Malus coronaria, WILD SWEET CRABAPPLE.

Morus rubra, RED MULBERRY.

Morus rubra tomentosa, WOOLY RED MULBERRY.

Ostrya virginiana, AMERICAN HOPHORNBEAM.

Phellodendron amurense, AMUR CORKTREE.

Populus alba nivea, SILVER POPLAR.

Populus candicans, BALM-OF-GILEAD POPLAR.

Populus tacamahaca, TACAMA-
HAC POPLAR.

Populus deltoides, EASTERN
POPLAR.

Prunus domestica, COMMON
GARDEN PLUM.

Prunus padus, EUROPEAN
BIRD CHERRY.

Prunus persica, PEACH.

Prunus persica plena, FLOW-
ERING PEACH.

Prunus, Cl. SWEET CHERRY.

Prunus sargentii, SARGENT
CHERRY — Japanese Flowering.

Pyrus communis, COMMON
PEAR.

Ptelea trifoliata, COMMON
HOPTREE.

Quercus andrewsi, ANDREWS
OAK — A native hybrid scrub
oak.

Quercus bicolor, SWAMP
WHITE OAK.

Quercus havardi, HAVARD
OAK — Dwarf.

Quercus imbricata, SHINGLE
OAK.

Quercus alba latiloba, WHITE
OAK.

Quercus ilicifolia, SCRUB OAK.

Quercus utahensis, UTAH
WHITE OAK.

Quercus borealis, NORTH-
ERN RED OAK.

Quercus montana, CHEST-
NUT OAK.

Quercus muhlenbergi, CHIN-
KAPIN OAK.

Quercus pungens, SCRUB
OAK.

Quercus prinoides, DWARF
CHINKAPIN OAK.

Quercus undulata, WAVY-
LEAF OAK.

Quercus velutina, BLACK
OAK.

Sambucus cerulea, BLUE-
BERRY ELDER — Tree Elder.

Sassafras albidum molle,
SILKY SASSAFRAS.

Tilia neglecta, QUEBEC LIN-
DEN.

Tilia Maximowicziana, MAXI-
MOWICZ LINDEN.

Tilia platyphyllos, BIGLEAF
LINDEN — Basswood.

Tilia platyphyllos rubra, Cl.
REDTWIG LINDEN.

Ulmus alata, WINGED ELM.

Ulmus carpinifolia, SMOOTH-
LEAF ELM.

Ulmus camperdowni, CAMP-
ERDOWN ELM — Weeping.

Ulmus hollandica, DUTCH
ELM.

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TREE FARMS

The term "tree farm" may be applied to a forest area managed and protected for the production of repeated crops of timber. It refers to the application of sound principles of forestry to privately owned timber lands. Although the tree farm movement is comparatively new as a planned program, many forest owners have been operating under its principles since the turn of the century. Their continuance in business long after their lands were expected to be "cut out" is evidence that crops of trees can be maintained on a continuous basis. Certification of additional thousands of acres as tree farms awaits the initiation of the program and inspection of the properties in other states.

Montana has now ten "tree farms." Texas has seventy-six. Colorado, none. Such a "tree farm" program can be started in Colorado.



Liriodendron tulipifera, TULIPTREE, in yard of H. N. Connell,
2151 Arapahoe, Boulder, Colorado



Acer pseudo platanus, SYCAMORE MAPLE, on grounds of G. B. Hardy,
2337 Eighth Street, Boulder, Colorado



Koelreuteria paniculata, VARNISH TREE

An item in a recent issue of the "American Nurseryman," gives us something to think about, and indicates an awakening appreciation of street trees. This article says in part:

"Prof. L. C. Chadwick (Ohio State College) recently completed a survey of the street trees in the city of Upper Arlington, Ohio, a suburb of Columbus. There are thirty-three miles of streets in the city. Data were recorded on the kind, number and location of all trees on street property. Recommendations were made for removal of dead, dying and unsatisfactory types of trees. Also recommended was a planting plan, to be carried out over a period of twenty to twenty-five years, completely to replant the streets. Uniform street plantings were recommended, and in most cases only one species of tree was specified for a single street. The survey was accompanied by a new city ordinance and complete arboriculture specifications for planting and maintenance."

DENVER'S FIRST ARBORETUM

IN the March issue of the **Green Thumb** Miss Olive Hensley reviewed the fascinating horticultural accomplishments of William Newton Byers. Reference was there made to a "Paper on Shade Trees" which Mr. Byers read at an early meeting of Denver's first Horticultural Society. The recent survey of Denver's deciduous trees (July issue of **Green Thumb**) makes the views of Denver's pioneer arboriculturist especially interesting at this time. A brief review of the "paper" read by Mr. Byers will be made, therefore. It is to be regretted that available space does not permit publishing the article in its entirety.

The trees discussed by Mr. Byers were the following:

Western Broadleaf Cottonwood (*Populus sargenti*).

Mr. Byers says:

"The first trees planted in Denver were set in the spring of 1865, if I remember correctly, and were cottonwoods. That was the first year we had any water upon the townsite for irrigation purposes, and we had but little at that time. A little ditch was dug by Surveyor General Pierce from Cherry Creek, leaving the creek at the Broadway bridge and coming out on the townsite. Surveyor General Pierce, Judge Steck and Mr. Tritch planted a few trees, and possibly a few others planted some.

"I planted some trees along Arapahoe street near Fifteenth in the spring of 1865, and I watered

them with a bucket, carrying the water from the Pierce ditch. That was the beginning of tree planting, and it was successful, so that the next year a good deal of tree planting was done. Our trees were mostly cottonwood, and since that time the cottonwood tree has been abused a great deal. Some people complain that it is not neat and handsome, and even that it is a nuisance. I think it is an unjust charge. While the cotton does fly from the trees during a certain short period of the summer, and is somewhat disagreeable, yet it is seldom so, for it is what some people term as clean dirt. There is nothing unhealthful about it and not much that is disagreeable. It is a native of the country. It makes a shade tree quicker than any other, and I still think a good deal of the cottonwood shade tree, as most old timers do."

Boxelder (*Acer negundo*).

"The next tree planted was the Boxelder; that, too, has since come in for a great deal of condemnation because it is infested with worms. That condition did not exist in the early days, and does now only in places. The pest began, according to my observation, along Champa street in 1889 or 1890, and it has spread gradually from that point in a southwesterly direction pretty well throughout the town."

Worms and beetles make the Boxelder unattractive to many people today, but not so, with this optimistic pioneer, who added, "It will certainly have a tendency to encourage bird life in Denver."

Black Locust (*Robinia pseudo-acacia*) was "entirely free from worms," in these days, and the two magnificent specimens near

Grant Avenue in the Capitol Grounds attest this fact.

Our native **Western Locust** (*Robinia luxurians*) was liked by Byers, though not as much as the Black Locust, or the **Common Honeylocust** (*Gleditsia triacanthos*) both with and without thorns.

Russianolive (*Elaeagnus angustifolia*) is today frequently planted to attract birds. Mr. Byers used the fruit himself, as well, for he writes:

"The tree blossoms late in the spring, but generally has a full crop of fruit. One year I experimented in pickling some, and after having forgotten to take them out of the brine for about a year, I found that they had a very natural taste. However, they were small. I do not know as they would be of any value unless they will produce oil. If they will do that it might be made one of the most productive fruit crops in the country. It is as hardy as the cottonwood, and its growth is pretty nearly as rapid. The tree is a pleasant feature in the landscape, because of its variation from the common color of the foliage of other trees. It has a whitish color, and the branches are exactly like the olives of commerce. The olive from the tree is a pleasant tasting fruit, and to eat a common olive of commerce alongside one of these, it would require an expert to tell the difference."

Elms (*Ulmus*) were planted but a "Crimson Leaved Elm," possibly *U. rubra*, proved wholly unsuited to this area.

Ash (*Fraxinus*) did well for a number of years, but then was "troubled with borers, and it looks to me as if they will be destroyed."

Silver Maple (*Acer saccharinum*) was a "good tree," but was

a "little subject to being broken from a strong wind or a snow." Byers preferred the slower growing **Norway Maple** (*A. platanoides*), "a good sturdy tree."

Oaks formed a prominent part of the Byers collection. The **Bur Oak** (*Quercus macrocarpa*) was his favorite, and the noble specimen at Byers Junior High School furnishes today tangible evidence of the great value of this tree. Another Oak with brilliant fall coloring (possibly *Q. coccinea*) did very well, but his **Swamp Oak** (*Q. folcata pagodaefolia*) and what he calls the **Pyramidal Oak** had a disposition to winter kill.

Russian Mulberry (*Morus alba tatarica*) was attractive to birds, but suffered much from a September snow. At the same time his "plantation of **Walnuts** (*Juglans*) happened to be very full of fruit and was almost destroyed."

"The **Balm-Of-Gilead** trees (*Populus candicans*) have done well too. The Balm-Of-Gilead is a very rapid grower and very handsome and attractive, but is the second to fall a victim to the borers. The first tree most likely to be attacked by the borers is the **Carolina Poplar** (*P. canadensis eugenei*). I have some of them, and the borers have cut most of them down."

White Buckeye (possibly *Aesculus glabra leucodermis*) which was "a tree I wanted very much to grow and preserve," died after "a year or two."

Butternut (*Juglans cinerea*) and **Black Walnut** (*J. nigra*) were both "valuable shade trees," the latter being the faster grower.

The review is concluded with a discussion of **Black Cherry** (*Prunus serotina*), which Byers took "a great liking to" but felt was unsuited to city planting because it was "too attractive to the boys.

In the spring they break down the trees to get the blossoms, and if there is a stem left in the fall they will break down the trees to get the fruit."

As is pointed out by Mr. Pesman in **Trail and Timberline** for June, 1931, Mr. Byers also grew successfully **American Chestnut** (*Castanea dentata*), **Common Hackberry** (*Celtis occidentalis*),

Kentucky Coffeetree (*Gymnocladus dioicus*), **American Linden** (*Tilia americana*), **Sugar Maple** (*Acer sacharum*), **Sycamore** (*Platanus occidentalis*), and **Cutleaf Weeping Birch** (*Betula pendula*).

Truly Byers Junior High School has a rich horticultural heritage from the man whose name it bears.

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W. J. ISE

WALTER J. ISE, a member of our present board of directors, died at the Presbyterian Hospital in Denver on June 29, following a short illness and an operation. He had been a member of the Association for many years and for six years he was its secretary-treasurer, giving to the duties of that office gratis many valuable hours of service.

Walter was a native Kansan, having been born at Downs, Kansas, January 22, 1882. A graduate of Kansas State Teachers College, the University of Kansas, and Yale University Law School, he was admitted to the bar in 1912 and practiced law for two years at Coffeyville. Then from 1913 to 1918 he was land law examiner in the Department of Interior, Washington, D. C. In

1919, he transferred to the Department of Agriculture, and moved to Denver in 1921 as law officer in the regional office of the Forest Service. He was admitted to the Colorado bar in 1931. At the time of his demise he was assistant regional attorney in the office of the solicitor, U. S. Department of Agriculture.

Walter was also a member of the Unitarian church, the Acacia Fraternity, Phi Delta Phi honorary law fraternity, and the Masonic Order, and leaves in each, as in our own organization, a host of friends who extend sympathy to his surviving relatives. These are his wife, who resides at 2620 Ash street, Denver, a daughter, two sons, his mother, who lives at Lawrence, Kansas, three brothers and four sisters.

L. C. SHOEMAKER,
Treasurer.

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Planning the grounds does not fall so easily into a system of plans and pictures as does home building, but it is certain that a carefully thought-out plan is needed if the home grounds are to be an attractive and useful part of that home. Each home, and the family there, is an individual problem and must be treated as such. The planting of small home grounds is no longer a fad. It is an essential factor in good living. A new fashion, however, must be developed in the design and planting of small homes from now on, so that each home will noticeably reflect these efforts. Such a fashion is long overdue, but surely not impossible to achieve.—LAURENCE G. HOLMES, in "Am. Nurserymen."

WHY SPRAY?

The fact that so many supposedly intelligent, educated, "Christian" people fell for Fascism, Naziism and other 'isms closer home demonstrates that a large majority of people prefer to have others think for them. So, in Horticulture, we have many who would have us lay down rules for certain success so that they are assured of wonderful results without the necessity of their thinking or working too hard.

The trouble with making rules is there are so many exceptions. It would not take us long to state the important rules for success in growing things, but it would take a lifetime to begin to tell how to handle the exceptions.

So, in spite of the clamor for exact rules we still think that it is the mission of this organization and its bulletin to tell Colorado gardeners the WHYS and compel them to exercise their own brains to work out the applications to fit their particular problems. This series of "Why" articles is planned to make you think WHY you do some of the common operations around a garden. So many things are done unnecessarily just from habit. If you know the **reason** for these jobs you will be able to determine whether your efforts are accomplishing any real good or not.

The reasons for spraying are still rather hazy in many gardeners' minds. One of the most frequent questions asked nursery and seedsmen is, "When should I spray my plants," as though a spray of any thing at one time would control all insect damage for the season. This indicates an ignorance of the purpose in spraying.

First, a gardener must find out whether it is actually an insect which is doing the damage. Mr. Kreutzer told us at our last meeting of simple ways to determine whether plant damage was caused by insect, disease, soil conditions or other causes. The next step is to examine the plants and determine what kind of an insect is doing the damage, and then find out what spray or dust is best used for control. Just to "spray" at any time, with anything, is usually a waste of time and materials. There is no magic spray available as yet which will kill all objectionable insects with one application. The reports of the new DDT chemical seem to indicate that it approaches that efficiency,

but even that would seem to have serious kickbacks. Until such a chemical is proven out, we should find out what insect is doing our damage, determine the best control to use and learn the best time and method of application.

Damaging insects may be roughly classified in five groups depending on the control methods necessary.

1. The aphid or plant lice. These are soft-bodied sucking insects and are usually controlled by a "contact" spray. They do not chew, but stick their sharp beaks through any poison that might be on the surface and live by sucking the plants sap. Since they are soft-bodied they are "burned" by some chemical strong enough to do this without injuring the plant. It is necessary that each insect be hit by the spray or dust. Preventative spraying can seldom be done, except that sometimes a "dormant" spray used for scale insects may kill some eggs or dormant adults. So, you can see why spraying at any other time than when they are feeding is usually wasted effort. Nicotine sulphate

(Black leaf 40), rotonone, and pyrethrum have been the most common chemicals used.

2. The chewing insects, such as beetles and caterpillars. These are controlled by covering the foliage that they are eating with a "stomach" poison so that they must eat some of the poison when they eat the plant. This coverage of poison must be done before or at the start of the damage to be effective, and usually must be repeated at intervals as new unprotected leaves appear or rains wash it off. Various chewing insects are controlled with a variety of chemicals used in a variety of ways, but the most common used in the past are Paris green and Arsenate of lead. Some chemicals such as pyrethrum have both a burning effect when used as a contact spray and also a stomach poison effect.

3. Slugs. These are slimy little snail-like insects which feed on the green parts of the leaves. As they are both chewing and soft-bodied they may be controlled by either method, or dry dust thrown on them will kill them. The thing which make them difficult to control is the fact that they grow so rapidly. In a week's time they may do a great deal of damage. They are especially fond of cherries and plums.

4. Red spider, spider mites and such. These may not be scientifically classed as "insects," but they do not know that and go ahead and do as much damage as any other "bug." They are very tiny and difficult to see. Their presence is usually indicated by a faded appearance of the leaves and a brown webby appearance on the under side of the leaves. They are discouraged by frequent strong sprays of cold water, but are most frequently controlled by the application of some form or

combination of sulphur applied as a dust or spray. They operate chiefly during hot weather.

5. Scale insects. These are related to the aphids, but instead of moving around as they feed, soon after hatching they crawl to a fresh location on the plant, stick their sharp beaks through the bark, shed their legs and grow a hard scale over themselves. They then have food and lodging provided for life. (This is real "social security," but who wants to be a louse.) The problem in controlling them is that any spray strong enough to penetrate their shell and kill them would also kill the leaves. The solution then is a "dormant" spray, when the leaves are off in the fall or spring. The common dormant sprays used are lime-sulphur and miscible oil.

Don't just "spray."

Find out:

1. If it is insects, or something else, which is doing the damage.
2. If it is insects, what kind of insect.
3. What spray or dust is most effective for their control.
4. When and how to apply this chemical.

Detailed advice as to proper spraying methods can be obtained from any good local seedsman or nurseryman. Or, send to the Extension Service of the Colorado State College for advice and bulletins. Popular garden magazines have published complete and well illustrated articles on identification and control of common insect pests. Packaged spray chemicals usually have directions for their use. The particular chemical used for a particular insect depends very largely now on what is available.

GEORGE W. KELLY.

(The opinions expressed here are my own and do not necessarily mean that the Association endorses them.)

WHAT DO YOU KNOW?

Check what you think is the correct answer to the following ten questions. Correct answers will be found on this page. Rate yourself ten for each question you have answered right. If you are above 80 per cent you are pretty good, or you have read and remembered all the articles in this issue. The questions are all answered in these articles.

1. What product of our forests is of greatest value to the state? Lumber? Water? Grazing? Recreation? Flood and erosion prevention?

2. The most satisfactory varieties of chrysanthemums for Colorado should be: Early flowering? Rank growing? Low growing? Large flowered? Winter hardy? Rich colored?

3. New lumbering methods have been developed which utilize 60 per cent of the timber cut. Our present lumbering methods utilize: 50 per cent? 20 per cent? 30 per cent?

4. Proper treatment for the control of slugs on cherry trees is:

A contact spray? A stomach poison? Dry dust?

5. G. A. Klaiber was Denver City Horticulturist for 9? 16? 27 years?

6. *Ailanthus altissima* is the scientific name for: Tree of Heaven? Black Walnut? Black Locust?

7. The five most important factors in the superior horticultural advantages enjoyed at Boulder, Colorado, are: More cloudy hours? Neutral or acid soil? Brighter sunshine? Latitude? Better drainage? More rainfall? Altitude? Longer season? Irrigation water? Rich soil? Proximity to the hills?

8. The first tree planted in Denver was: Boxelder? Elm? Cottonwood?

9. The first trees planted in Denver were set out in: 1875? 1865? 1860?

10. Three of the most valuable shrubs for fall color in Colorado are: Ginnala maple? Dogwood? Spireas? Sumacs? Flowering plums? Honeysuckles? Viburnums? Lilacs? Euonymus?



ANSWERS — 1, Water; 2, Early flowering, low growing, winter hardy; 3, 30 per cent; 4, Any of the three; 5, 27 years; 6, Tree of Heaven; 7, More cloudy hours, neutral or acid soil, better drainage, more rainfall, proximity to hills; 8, Cottonwood; 9, 1865; 10, Ginnala maple, sumacs, viburnums.

G. A. KLAIBER RETIRES



MR. G. A. KLAIBER, for 27 years Denver City Horticulturist, has retired and now lives with Mrs. Klaiber at Spring Brook Gardens on the South Fork of the St. Vrain river, near Lyons, Colorado. Spring Brook Gardens is one of the beauty spots of Colorado and well it should be with its marvelous natural surroundings, together with Mr. Klaiber's outstanding ability to get the most out of everything that grows.

Denver wasn't much of a place back in 1912 when Mayor Robert W. Speer first came into office but he had visions of Denver's being a magnificent city ornamented by the finest of parks, trees, parkways, lawns and flowers. Mayor Speer sought out men of proven ability and technical skill who

could help him make his dreams come true.

It was logical that he should choose as one of these men, Mr. Klaiber, who was then operating his own fruit farm near Longmont and was Horticulturist for Boulder County. That this choice was fortunate for Denver is evidenced by the fact that Mr. Klaiber carried on the fine work during eleven city administrations indeed long after Mayor Speer had passed on.

Mr. Klaiber's love of Denver was natural as he came to Denver from Cincinnati in 1876 with his father and mother and family. He was then six years old and was the youngest of seventeen children. His father was a doctor and practiced in Denver for many years. As a boy he drove the horse and buggy for his father as he made his regular calls on his patients and thus saw many unusual incidents in Denver's early history. He attended Arapahoe Street School, Stout Street School and later Gilpin. Aaron Gove was superintendent and Helen Coy was principal of Arapahoe. After graduating from Gilpin, Klaiber attended a private school run by Professors Tarbert and Millegan.

Klaiber's interest in the outdoors was evident at an early age. His father owned a ranch north of Denver and he encouraged the boy in his natural tendencies. As a young man he was manager of Judge B. F. Harrington's Thoroughbred Horse farm north of Denver, and from there he bought his own fruit farm near Longmont which he operated until he was appointed Denver City Horticulturist.

Mr. Klaiber married Ada Dell Large, a daughter of one of the early Longmont pioneer families.

They recently celebrated their fiftieth wedding anniversary.

In connection with the Denver job Klaiber was the United States Plant Quarantine Inspector, being appointed by Dr. Marlott, Chief

of the Horticultural Board, Washington, D. C. Klaiber also worked in close cooperation with Professor C. P. Gillett, Colorado State Entomologist, Colorado State College at Fort Collins.



WHAT ABOUT FORESTRY IN THE ROCKIES?

SGT. G. W. CARLSON

J. Lee Deen, dean of the division of Forestry and Range Conservation at Colorado A. & M. College, Fort Collins, Colorado, writes of the author: "Carlson is a graduate of forestry from this institution in the class of 1943. He is now with the 10th Mountain Infantry division, and the last I knew of his whereabouts he was in Italy. During his spare time in this country and in Italy he wrote this article about forestry in the Rockies. It shows that boys in service are thinking about what is going to happen to our forest resources in this country when the war is over."

ARE the forests, in general, in the Rocky Mountain Region managed so as to obtain their greatest utility? Would it be possible to obtain a higher standard of utilization and thereby reduce waste materially? Or is it necessary to reduce waste?

First of all, this region has a vast supply of timber which is only partially used, and which does not notice a little waste. If an area is cut off and then the demand is not satisfied, there is always more of the same to fall back on. But we know this cannot go on forever; look back on the plight of the East Coast Region, the Lake States, and now the West Coast.

We know the West Coast is still operating and will be able to for some time, but it is also very evident that it does not have the supply it did have at one time. It is possible that this region can prevent a catastrophe in the lumber industry by proper application of management, but so far this has not been done, and it's questionable if it will be done in time to maintain a sufficient supply.

To come back to the Rockies. The region has scarcely been

touched, but with a depletion of other regions it will be necessary to draw on our resources. If this were to happen, it would be a necessity that we be prepared. We cannot carry on with destructive logging methods, carelessness with fire, and little protection against insects and disease, if we want to be prepared for a disaster in some other area. When the time comes that we are called upon, we want to be able to give a ready answer. Now is the time to begin our preparation.

Suppose other regions are able to carry on with no aid, then why should we bother with any management program? There is still a lot of timber to be harvested before we will be required to supply a great part of the United States demand, and plenty time to get around to it. Perhaps so, but it must be kept in mind that growth is slow in the Rockies, and we not only want the quantity, but the quality. It would be of great value to those cutting now to produce a better-grade lumber, to be able to cut straight trees for poles and mine timbers, and to know that they could go out and find some consistency in the timber they are about to cut.

When the term "forest management" is used, it doesn't ne-

cessarily refer to an increase in timber, although that is one of its great functions. Forests should be managed so as to receive the greatest value from the area on which they are found. Lumber production is of minor importance in Colorado and other parts of the Rockies, but the timber on that land is of utmost importance.

Watershed protection is one of the chief functions of our forests, and it should be stressed. Foresters should be conscious of this fact and should pass it right on down the line. It has been known for a long time that forests exert a great influence on water in our streams and lakes, but now a great deal of experimentation is being done along this line, and we are learning more all the time just exactly what these influences are.

Tree spacing, size, type and many other factors enter into this great picture, and each individual area must therefore be worked out for itself. Some places are gentle hills, sparsely covered with Ponderosa Pine, while others are steep slopes with a growth of dog-hair Lodgepole. Chances are the first area is of some value, but the second does little more than retain a little water. It certainly could be opened up to great advantage and still be of just as much value, if not more, for watershed protection. Of course broadleaves and conifers differ greatly in their effects, and each has a variety of differences according to the species present.

Now comes the question of return. Humanity dislikes the idea of doing anything unless it can realize a return. To build up a forest just to watch its effect on the rains which come seems a waste of time, money, and effort, which it is unless worked in conjunction with some other program. To manage a region for

watersheds alone will, of course, aid in preventing floods somewhere down along the line, but more than that will be expected. Perhaps a community or several towns will be directly affected by an improvement in the water supply, but the land owners and residents of the managed areas cannot see its value unless they themselves can realize a profit.

It has already been shown how lumbermen can profit by an increase in quantity and quality of produce. In most parts of the Rockies where logging is not practiced (and many where it is), grazing is a very important occupation. This is one of the most important aspects of forest management in the Rockies. At the same time watersheds are being improved, the grazing value of the land can be increased.

Ranging livestock has been a great problem for a long time, and much has been done about it. Overstocking has been reduced, grass has been planted, and the type of stock best suited for certain ranges has been placed there, but we still aren't getting the maximum value from our ranges. The forest type on a land has a lot to do with the grass that will grow there and how well it will grow. Soil acidity, temperature, moisture content, and erosion are a few of the complex number of conditions effected by the type and density of the forest. Some areas with a good covering of grass and no timber sometimes erode badly, taking the grass along, while they wouldn't if there were a covering of trees along with the grass. It is of great importance that the aspect of range management and grazing be considered at the same time our forests are being managed for other purposes.

To convert all the forests to great controlled areas is not the

purpose of forest management. Its purpose is to utilize an area for what it is best suited. Many large areas are best the way nature has left them, and our national parks take care of part of these. Some regions are inaccessible for cutting, and they protect the land well. These areas furnish the aesthetic value which millions of people travel across the country each year to see and enjoy. These areas must be protected to maintain the income of those who depend on tourists for a living, as well as for the interests of the tourists. By cooperating with game and fish departments, conditions can also be improved through forest management for the game which many tourists and residents seek. An improvement in fishing conditions is usually realized with watershed pro-

tection through forest management.

Working out a plan which is flexible enough, yet of great enough value to cover the types of management necessary on certain areas is like trying to work out peace plans to satisfy everyone concerned. I do hope, however, that plans can be drawn up for a fairly large area, and that it can be done in the near future. A plan of this type would aid in solving the huge unemployment situation which will inevitably come in the very near future with the fall of Japan. It would give employment both in technical and non-technical lines. Close supervision will be necessary to insure proper results, and a great many men will be pleased to work with a free life in the forest.

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DO JOBS GROW ON TREES?

ALMOST two and a half million dollars' worth of fruits and nuts (including wild black walnuts) are harvested annually in Colorado according to the last census. In addition \$114,280 is mentioned as the income for Forest Products sold. This total exceeds that for Horticultural Specialties sold in Colorado.

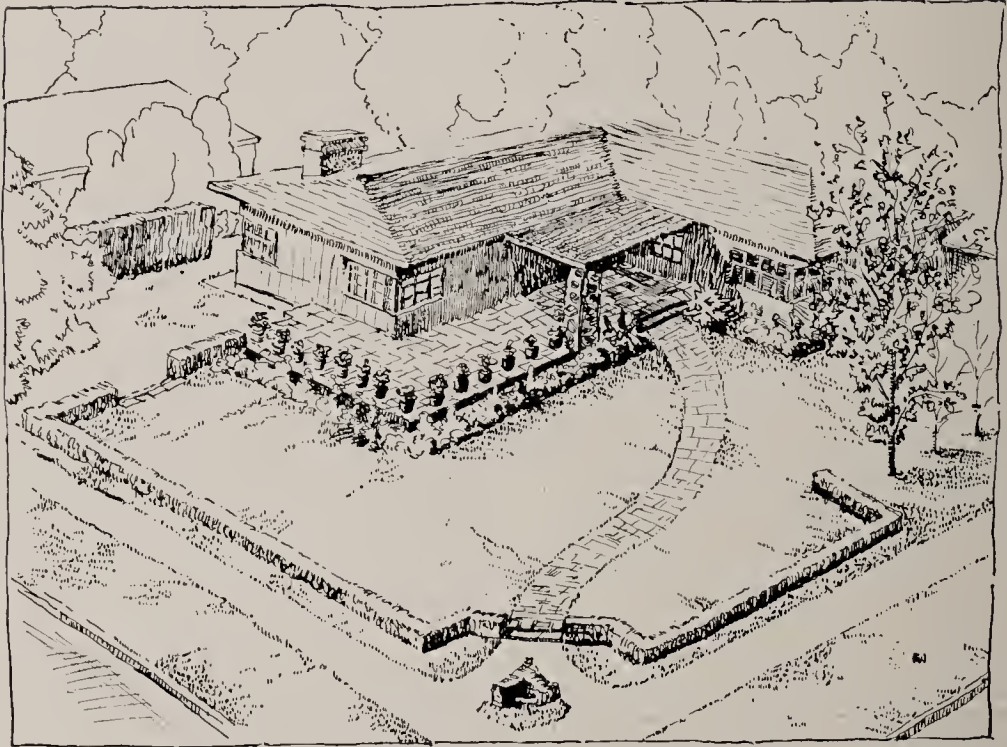
There is a likelihood of a greatly increased figure for forest

products when our next census is taken. Two possibilities loom up large: impregnation of inferior wood under pressure, making it as durable and substantial as hardwood, and utilization of sawdust, woodpulp and wood refuse for a multitude of valuable products, such as sugar, alcohol, synthetic rubber, feeding yeast, road binder, glue.

Science has made possible a utilization of timber to the extent of 60 or 70 per cent instead of the present 30 per cent. Will that create new jobs? Congressman Ellsworth of Oregon thinks so. The National Lumber Manufacturers Association thinks so.

Two million new jobs are estimated to result from this new utilization of forest products. Colorado should get busy and take advantage of this new opportunity, which will make even inferior wood valuable.

BEAUTY IN SIMPLICITY OF LANDSCAPE DESIGN



Plan by S. R. De Boer

Picture by Frances White

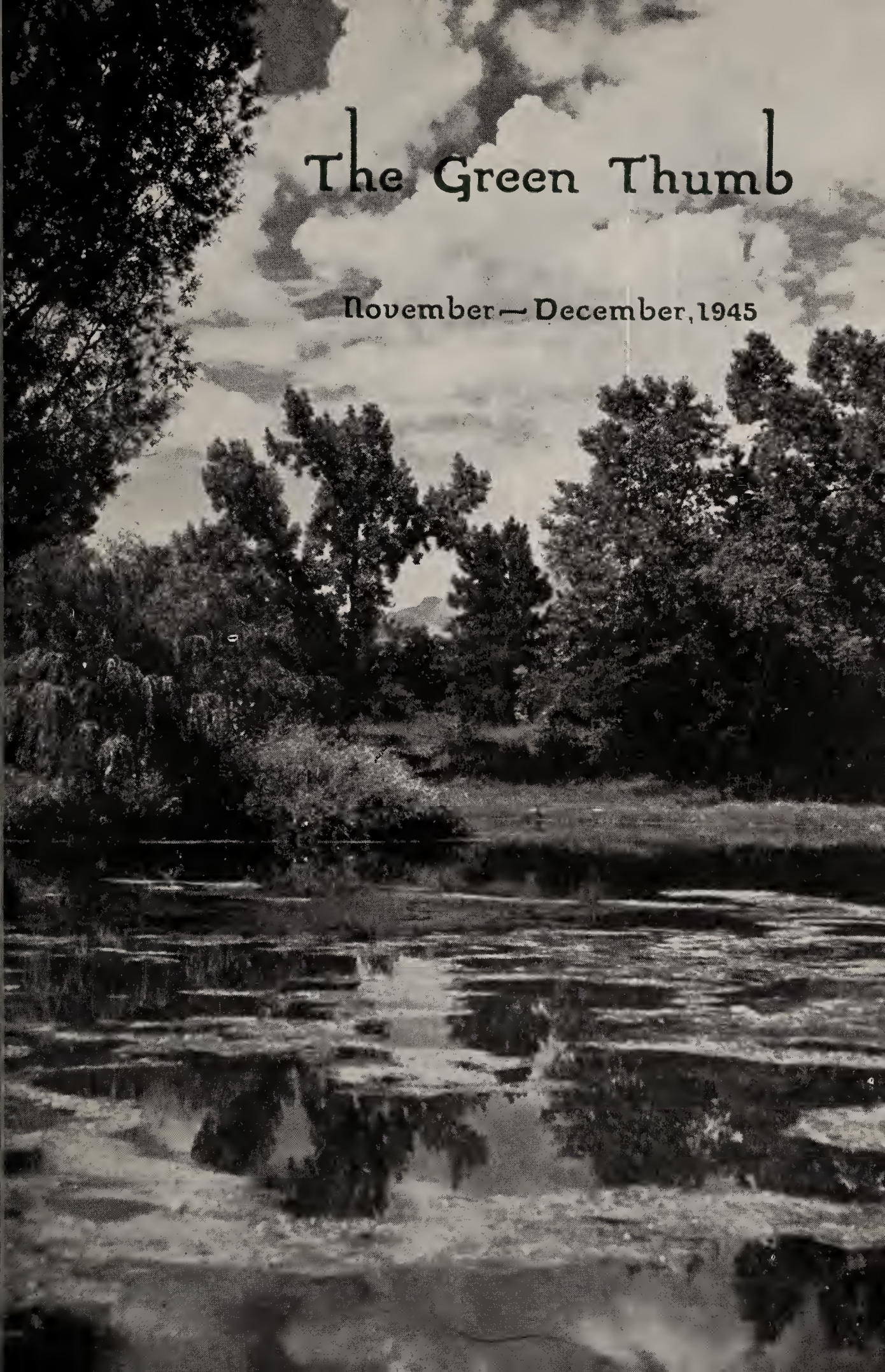
The picture shows the front yard and residence of Mr. and Mrs. Anthony Sweetman on South Corona Street in Denver. The house is unusual with horizontal lines predominating, a long overhanging roof, and intriguing corner windows. The front entrance is under a porch.

The garden plan is simple and reproduces the lines of the house on the ground. Tree planting is kept to a minimum in order to get the full benefit of the morning light. The garden is hedged in by Lodense Privet, which is also used for the background of the house number. Against the terrace is a planting of some low junipers and flowers. Above them on the terrace are rows of potted salmon colored geraniums. A drooping white birch and flower planting makes the foliage frame on one side, and purple leaved maples form the other side.

The place is on a fifty foot corner lot, and has a garage attached to the building. It is intended to illustrate the point that simplicity is the keynote of modern garden design. The place is friendly and smiling, and adds greatly to the charm of the city block in which it is located.

The Green Thumb

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~~~~~ THE GREEN THUMB ~~~~~

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Organized in 1884

George W. Kelly, Editor

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Hours: 11 to 2 — Monday, Wednesday and Friday

"To preserve the natural beauty of Colorado; to protect the forests; to encourage proper maintenance and additional planting of trees, shrubs and gardens; to make available correct information regarding forestry, horticultural practices and plants best suited to the climate; and to coordinate the knowledge and experience of foresters, horticulturists and gardeners for their mutual benefit."

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VOLUME II

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HUNT FOR GREEN THUMBS

Those people who have loved plants and growing things, and have had such a feeling for them that all plants which came under their care seemed to prosper and grow exceptionally well have been referred to for many years as having a Green Thumb.

All of us, in this Colorado Forestry and Horticulture Association aspire to having at least a faint tinge of Green on our Thumbs, but in almost every community there are a few fortunate people who have really deep green thumbs. The plants in the gardens of these people all grow vigorously and many "impossible" things are made to survive, if not flourish. All the seeds they plant, all the cuttings they set out and all the plants they transplant live

and grow. We would like to bring these people and their "secrets" of success out in the spotlight so that we might become acquainted with them and profit by their successes.

Will each member of the Green Thumb family send to the editor their nominations for "Super Green Thumbers" in their community. We would especially appreciate knowing of these people in the smaller communities of the state. We will attempt to interview them and report in future issues what we have found out that might be of interest to all members. These people may be amateur, professional, men or women, young or old; just so they have had unusual success with plants.

TRENDS IN ORNAMENTAL PLANTING

By DONALD WYMAN, Arnold Arboretum

Editor's Note: We are fortunate indeed to have Dr. Wyman contribute this timely article to The Green Thumb. As most of our readers know, Dr. Wyman is horticulturist for the world famous Arnold Arboretum. His recent article in "Arnoldia" entitled "The Park Arboretum, How To Establish One As A Living War Memorial" has already been quoted from in The Green Thumb.

As Dr. Wyman states the Serbian Spruce and the Flowering Dogwood are not hardy everywhere. They have not been successful in Colorado. We suggest in their place, two Colorado natives that are employed all too frequently: namely, the White fir (*Abies concolor*) and the Colorado Redosier Dogwood (*Cornus stolonifera coloradensis*). The White Fir has soft flat needles, and less rigidity and discord than the Koster Blue Spruce. Our native Dogwood, like its more brilliant relative, has small flowers in the spring, fruit in the summer, a fine red color to its leaves in the fall and a striking winter effect with its brilliant red bark, particularly if the old canes are cut out every spring.

THOSE who grow and sell plants are realizing that, with changing times, the public is continually demanding newer and better types of plants. It used to be that any nurseryman could grow a number of the more common ornamental plants and find a ready market for his goods, but now these common varieties are not enough to satisfy the gardening public. Newer and better varieties receive wide recognition through catalogues, garden magazines, garden club discussions and radio talks, as soon as they are available on the market. Through these media, gardeners are becoming quickly familiar with the newer materials and naturally buy from the plantsmen who can supply them.

Gardening is becoming of interest to an increasingly larger group of people because more new homes will be erected now than any time since 1929. With better times, many other gardeners are finding it possible to spend more time and money on this enjoyable pastime and plant sales are expected to near the 1929 peak this spring.

There is no question but that variety in the plant materials about the home makes the landscape more interesting. It is not necessary to plant a Japanese barberry hedge simply because all the neighbors have one. The real gardener will use something new and different in order to add zest

and interest to his plantings. He may choose the new, upright growing form of the Japanese barberry called the Truehedge Columnberry, and if he selects this, he will be doing well, for it makes a much better hedge and is considerably easier to keep clipped than the old-fashioned form. Incidentally, over 200,000 plants of the Columnberry were sold by the nursery introducing it in 1934, the first year, showing how rapid the turnover of a new meritorious plant can be with the aid of good advertising. Now there are probably nearer 1,000,000 of these plants sold each year by many nurseries who have the selling privilege under the patent.

New Varieties Replacing Old

In talking with a nurseryman who makes a speciality of growing roses, I was interested to learn that of 266 roses offered, 137 of them have been introduced into the trade since 1931. This nurseryman is finding it essential to stop growing a large number of the older varieties simply because the new ones are better or much more in demand. The same thing can be said of iris, gladiolus, delphiniums, phlox, peonies and many other large groups of garden plants. Specialists are constantly breeding new varieties in these groups so that better forms are being introduced almost every year. The gardener is kept familiar with these introductions through various publications and

the plantsman has to grow them to satisfy his customers.

Two examples might be given of plants which have passed the high water mark of their popularity. These are the large flowered **Hydrangea paniculata grandiflora** and the Koster's blue spruce. Both are easily grown and most conspicuous in gardens. Millions of both have been sold but with the trend towards more restful plantings these two plants are not being used by the far-seeing gardener. It used to be that such plants were placed in the middle of open areas because they were conspicuous, but now the tendency is to leave such areas unbroken wherever possible and in any event to use better materials as specimens.

The climbing **Hydrangea petiolaris** has considerably more interest than the bush form, and people are beginning to realize that the Blue Spruce does not grow old gracefully, but in later years gets very ragged and unsightly at the base. A much better plant to use in its place, in the East at least, is the newer Serbian spruce (**Picea omorika**) which has excellent dark green foliage, somewhat pendulous branches, and its beauty does increase with age. Formal plantings have their place, but in the majority of plantings on the smaller properties, restfulness and quiet are the chief objectives, and the large flowered hydrangea and the blue spruce do not aid in the attainment of these objectives.

Plant Characteristics Important

It used to be the "style" to plant many upright growing evergreens around the base of the house and keep them closely sheared. This fad is fortunately fast disappearing, since such unsightly plantings are not in the least restful to the eye and only accentuate the base of the build-

ing, whereas a good foundation planting should aid materially in tying in the house with the surrounding landscape. People are beginning to realize that only certain of the lower growing plants are suitable for foundation planting, since taller growing types eventually obscure windows and sometimes are impossible to restrain properly.

Gardeners in general are giving more and more attention to the special attributes of particular plants, their ultimate height, time of bloom, fruiting characters, autumn color and the like. Often great care is taken in selecting even a few plants, to ascertain that they will fulfill the purpose for which they are desired with a minimum amount of care. Plants, particularly woody plants, are being selected that have interest at more than one season of the year. The mock-orange, for example, may be of interest only when in bloom, but the flowering dogwood (where hardy) on the other hand, has interest every season of the year because of its good flowers in the spring; its green foliage in the summer which is not susceptible to any serious disease or insect pest; its outstanding red fruits; and red autumn color in the fall; its interesting horizontal branches all winter long. If a little time and thought are given to the selection of a plant, usually just the right plant for the right place can be found.

This growing interest in plant materials is forcing many cities and state highway commissions to intelligently plant the highways. Formerly little attention was given to this, but with so many people depending largely on motoring for enjoyment and relaxation, the beautification of the highways cannot be overlooked. Groups of citizens inter-

ested in gardening are going a long way in vigilantly compelling many otherwise reluctant highway commissions to landscape our highways. Now many city and state highway commissions have their own landscape architects who are responsible for making unattractive parts of the highway beautiful, by using the right plant materials.

Our knowledge of pool construction has increased considerably during the past few years for now we can build pools that will be waterproof for many years. Garden pools are increasing in popularity for many a garden is greatly enhanced with the addition of a beautiful spot of still water. Water lily specialists have improved water plants to such an extent that now there is a great demand for them. The tropical fish fad which swept the country a few years ago induced many people to build outdoor pools, for such places are ideal to put small fish during the summer period. Here the fish can readily feed and multiply under the leaves of the protecting water plants.

Rock gardens are still very much in favor and the tremendous number of new plants now available for these plantings is astounding. The rock garden enthusiast uses terms that may be difficult for the ordinary gardener to understand, and quite often his one and only interest in gardening is his rock garden.

Garden Illumination

Garden lighting is fortunately becoming popular and soon there will be firms again manufacturing special lighting equipment for this purpose. It proves most interesting, for just by the turn of a switch the home owner can show all or part of his garden to his guests even on the darkest night. The lights vary in size and strength

but all connections are made completely waterproof and can be used for several years. One of the most interesting points about the equipment is that it can be easily moved from one part of the garden to another and so the home owner can move his equipment continually, to illuminate each part of the garden as it comes into bloom.

Electricity is again coming to the aid of the gardener in the form of the electric hotbed. These hotbeds, heated by electric cables in the soil are comparatively inexpensive to construct and to operate and are opening new fields of endeavor in the garden. By such means it is possible to grow seedlings early, to have early radishes and lettuce, and to propagate many ornamental plants by cuttings.

Many a tired business man gets real enjoyment and relaxation from planning and working in his garden. With all the modern aids available, his inclinations can follow any one of many interesting lines. The garden becomes a place where he works for amusement and enjoyment, where he takes his friends for healthful outdoor relaxation, an "outdoor living room" in every sense of the word.

These are a few of the concrete arguments for local arboretums. People are becoming so increasingly interested in the enjoyable phases of gardening that it behooves the community to assist in every way possible. In Denver, for instance, a local arboretum is much needed. If funds could be found for such a worthy project, the entire community and surrounding country as well would benefit. It could easily lead the way in making the entire community a more beautiful and enjoyable place in which to live.



A 4-log Ponderosa Pine tree 53.4 inches a. b. h. (14 inches circumference) located near the Lone Dome Truck Trail in the Dolores Canyon. Photo by U. S. Forest Service.

COLORADO FORESTS CAN SUPPLY JOBS

J. LEE DEEN

V-E day and V-J day have come and gone. The problems of peace are replacing those of a war economy. Millions of service men are being released and other millions of defense workers are being laid off. Every possible avenue of employment must be explored.

The American Forestry Association, with which the Colorado Forestry and Horticulture Association is affiliated, recognized this problem some time ago and what is more, decided to do something about it. As a contribution to postwar reconstruction and to factual handling of postwar forestry questions the Association early in 1944 launched a fact-finding survey to determine what effect the war was having upon the country's forests and forest lands and what would be their condition when hostilities cease.

Mr. John B. Woods was selected national director of the Survey. Through a cooperative arrangement with Colorado A. & M. College, J. Lee Deen and J. C. H. Robertson were appointed regional consultants for the Central Rocky Mountain Region and the Southwest. In as much as most of the forest lands in these regions are publicly owned the job consisted largely of obtaining data from public agencies, chiefly the U. S. Forest Service.

The U. S. Forest Service is co-operating with the American Forestry Association in the survey and is revising its estimates of stand, growth, drain and other pertinent data in the light of present-day developments. Over the United States as a whole the heavy cutting occasioned by war demands will be an important factor to consider when making future plans. The loss sustained through the Englemann spruce

bark-beetle epidemic in Colorado has reached proportions, the significance of which is not realized in this state. Mr. Theodore Krueger is making the revision for the Forest Service in consultation with Mr. B. R. Loxen of the Rocky Mountain Forest and Range Experiment Station.

Virtually all of Colorado's timber is composed of softwoods—largely Engelmann spruce, lodgepole pine, Douglas fir plus some minor species. There is a timbered national forest area of about nine million acres, and privately-owned and state forested land amounts to approximately five million more. In addition there are approximately five million acres of timbered lands in other federal holdings such as National Parks, Indian Reservations and Grazing Districts. There is a state forest of approximately 70,000 acres. Although much of Colorado forest lands are classified as non-commercial, chiefly valuable for purposes other than timber, Forest Service figures show that commercial forests cover an area of approximately eight million acres in this state.

It is estimated that the current annual growth of saw lumber in Colorado is approximately 300 million board feet, yet in 1943, under pressure of war-time need for lumber, only 89 million board feet were cut. True, this cut would have been higher had sufficient woods labor been available but an annual growth exceeding the cut is the usual thing. It should be marked that because of the ravages of the Engelmann spruce bark beetle the current spread between growth and cut is considerably less than in 1943. There are now 27 billion board feet of commercial saw timber in Colorado's national forests.

The market for lumber is here. Some species such as aspen require specialized use such as for match sticks and excelsior. The U. S. Forest Service has brought in a large cooperage manufacturer which is operating in lodgepole pine. The largest single market for native lumber at the present time are the packaging industries. Approximately 80 per cent of the lumber used by these industries is now shipped in from outside. Not only is Colorado losing transportation charges, but labor is being employed elsewhere which could well be adding to the annual income of our state.

Colorado presents definite problems which call for initiative and ingenuity in solving. The terrain is rough and rugged and the trees are relatively small in size. This makes for expensive logging.

It appears that Colorado conditions call for a radical departure from orthodox logging methods. Just what changes will take place the writer does not know, but come they will.

Rather poor methods of manufacture used in processing native lumber have further complicated the picture. Poorly sawn, poorly seasoned boards have been the rule too often. Grading has been practiced only rarely. This need not be. Several examples have been found of local sawmill owners who are highly successful. These firms have built their business on excellent manufacture, proper seasoning and careful grading, thereby demonstrating that good lumber can be made here. The days of reward to men of imagination and enterprise are still with us.

CONSERVATION WHAT CAN I DO ABOUT IT?

We are all interested in conservation, but most of its applications are distant and vague to us. We may believe in conserving soil, and grass-land, and forests, and birds, and flowers; but we are not farmers or foresters or woodsmen and can do little more than preach the gospel of conservation.

In one form of conservation we can all help — conservation of natural beauty — and who would say that this is not important. Do we not all wish to preserve the wonderful beauty of our country for our children's children? Conservation of natural beauty is subject to two abuses. The one of removing or defacing existing objects of nature, and the other of leaving civilized material to clutter up and spoil the natural effects. We should all develop the habit of never leaving foreign material in the beautiful wild

places. We enjoy these places because they are wild and natural, and remind us that they are the result of ages of evolution. One orange peel or gum wrapper can spoil the illusion we so cherish. Why not form the habit now of never throwing down a piece of paper or wrapper, or can or other waste material? And while we are at it, why should we throw such things out the car window at any time? They make the roadside and streets look messy and unattractive. Make a habit of collecting such things in a special pocket or the glove compartment of the car and emptying them where they can be burned. This is one thing that we can ALL do to preserve our natural beauty. It is so small a thing, but means so much. None of us would so thoughtlessly throw rubbish around our own yard or house, why not be as considerate of others?

COLORADO TIMBER MAKES GOOD FENCE POSTS

JULES RENAUD, Forester,
Soil Conservation Service

BARBED wire and woven wire, staples and posts. Just like taxes, fence repair is an expense that every rancher has every year. He must keep up his fences to keep out trespass stock and control the movement of his own stock within the ranch.

It takes cash to buy wire and staples but most ranchers can reduce their fencing expense by making their own posts. Every ranch in the mountains has young, thrifty stands of pine, spruce and fir trees. Trees that are just the right size for fence posts, but have not been used very much because they usually rot out in about five years. Instead split cedar or pitch pine posts are bought which have been shipped in from Idaho, Montana or South Dakota.

If nature was careful in the way she scattered seed, young trees would be spaced far enough apart to develop into a fully stocked stand without crowding. But instead of that, the seeds are scattered the thickest around the base of thrifty seed trees and grow into a dense stand of young saplings. So many that they soon crowd each other, fight for light, water, and food until the weak trees stagnate and die. The weak trees should be removed so the better trees can grow quickly to sawlog size. Thinnings of this kind can be treated with preservative and made into a durable fence post. There's no need of paying a high price for a fence post that must be shipped hundreds of miles when good fence post material is available right at home.

A man equipped with an axe and a Swedish cross cut saw can make a hundred or more posts a

day by thinning out overcrowded thickets of pine, spruce, or fir. It is work that can be done any time during the year. The Swedish saw has a tubular steel frame and is a big improvement over the old buck saw.

These posts must be treated with preservative, but this is not difficult or expensive and there is a treatment to fit nearly every condition. The old standard treatment is to heat dry posts in a hot creosote-oil mixture for an hour or more. Posts treated this way 30 years ago are still in good condition.

A newer process which shows great promise is to soak dry, peeled posts in a cold solution of diesel fuel or kerosene to which is added a little poisonous chemical called pentachlorophenol. This is sold under the trade name of Permatox A and posts placed in it for from 12 to 24 hours will soak up enough preservative to give them a long life.

Both of the above methods work satisfactorily only on peeled posts that have dried for 3 to 6 months after cutting. Usually a rancher wants his posts right now, so he may prefer one of the following methods recently developed for treating freshly cut, green posts. When these posts are placed in a barrel containing a solution of zinc chloride salts and water they will quickly soak up enough of the poisonous zinc chloride to effectively preserve the portion of the post which is to be placed in the ground. The high war-time price of zinc chloride makes it an expensive treatment which may average as much as 25 cents per post as compared with the other treatments which will cost from 6 to 15 cents.

Two new treatments which show great promise use sodium fluoride and other toxic salts mixed with water or with a coal tar liquid. The salt and water paste is daubed on the outside of the freshly cut, peeled posts and the posts are then covered for 15 to 20 days with a waterproof covering while the salt penetrates into the wood. The posts are then dried and are ready to go in the fence. The salt-coal tar mixture can be painted on the butt of the freshly cut post and covered with a strip of tar paper. The post can immediately be set in the ground and will treat itself during the following months. These treating materials are sold under the trade name of osmose salts and osmoplastic.

Last fall five field demonstrations were held in central Colorado to show the actual treatment of pine, spruce and fir posts by

the above treatments. These demonstrations were sponsored by Soil Conservation Districts, who were assisted by men from federal and state conservation agencies.

It is planned to have more demonstrations this year to show Colorado ranchers how they can thin their thickets of young pine, spruce and fir trees and use these thinnings to make fence posts, which when treated with a preservative, will give a long lasting post and help reduce one ranch maintenance post. Portable power saws will also be in operation at these demonstrations.

Russell Ford, State Extension Forester, Fort Collins, will be glad to send you complete information on any of the above post treatments or it will be sent at your request from the Soil Conservation Service at Littleton.

GEORGE BEACH RETURNS TO FORT COLLINS

Major Geo. A. Beach, who has been on military leave from the department of horticulture, Colorado A. & M. College since 1942, has now returned to the college. Major Beach has served with a field artillery unit in North Africa, India and China, and was overseas for 15 months, returning to the United States in August. Major Beach has assumed his

duties as professor in the department of horticulture and will again take up his classes in ornamental horticulture and landscape design, as well as research in the field of floriculture. In addition to his regular duties, Professor Beach will act as veteran counselor for returning ex-service men in the division of agriculture."

AFFILIATED MEMBERSHIP

Combined membership in the Colorado Forestry and Horticulture Association, including the publications of both organizations — the Green Thumb and American Forests — may be had for \$4.00. For this type of Affiliated Membership, please send check for \$4.00 to L. C. Shoemaker, treasurer, 1608 Broadway,

Denver. This arrangement will make it possible for you to keep in touch with the latest forestry and horticultural development, not only in Colorado, but throughout the entire nation. New affiliated membership is open only to those who are not now members of the American Forestry Association.

TREES FOR ZONE 8

El Paso and parts of Douglas and Elbert Counties.

The deciduous trees listed for use in Zone 4 in the July-August issue, as well as the additional trees for Zone 5 listed in the September-October issue apparently are all about equally valuable for use in Colorado Springs. In outlying districts, which are less protected, the list is severely cut. Some small valleys may have favorable conditions where they might be warranted in trying anything from the Zone 4 or 5 list, while other areas close by but without the favorable conditions might be limited to a very few

hardy things. Such an abbreviated list is reported from Elizabeth, Colo., for example. Following is a check list of about those trees which are possible to grow in these less favorable parts of the zone: Soft Maple, American Elm, Chinese Elm, Russian Olive, Green Ash, Pink Locust, Siberian Pea, Box Elder, Willows, Hackberry, Wild Plum, Honeylocust, Catalpa, Chokecherry, Narrowleaf Poplar, Lanceleaf Poplar, Silver Poplar, Carolina Poplar, Western Cottonwood, Native Hawthorns, and Sumac.

We are indebted to Mrs. K. N. Marriage of Upton Gardens for much assistance in checking trees in Colorado Springs and locating pictures of them.



Trees on Colorado College Campus. Photo by H. L. Standley.



Trees in Monument Valley Park, near Fine Arts Center, (



Springs. Pikes Peak in distance. Photo by H. L. Standley.

IT'S EASY TO GROW ROSES

By FRANK M. RICHARDS, Richards' Gardens, Fort Collins

Treatment on Arrival

WHEN you receive your roses give them the greatest care; **never expose the roots** to the drying action of winds for a moment. Unpack the package immediately and plant as soon as possible. Don't wait for warm spring weather; plant dormant roses as soon as possible after frost leaves the ground but **don't work soil while it's sticky**. If you're not ready to plant, heel-in plants in a corner of the vegetable garden or other out-of-the-way place. Cover tops and all with moist soil; they will keep here up to a week or ten days if necessary.

Planting Location

Where you have room for only a few roses, they need not always be in a bed by themselves; planted in front of taller shrubs or low evergreens roses will provide summer and autumn color often lacking in border and foundation plantings. It is surprising how a few Hybrid Teas and especially Polyanthas carefully set in the foreground will be perfectly at home, even though it may be in partial shade.

Preparing a Rose Bed

We're terribly annoyed when we read how important it is to "excavate" and prepare a rose bed according to a lot of half-baked theories that have been handed down from one writer to another when we know and have demonstrated that the culture of roses is no more difficult than that of any other flower (indeed, **easier** than many!)

If you are going to plant new roses in a place where you have been successful with other flowers before, little need be done except a thorough spading about twelve inches deep (one spade depth). If you are forced to plant

in a new location where the soil is low in fertility it may be better to remove about nine inches of topsoil, putting it to one side, then dump in enough manure to cover the bottom of the bed two or three inches deep, and **fork it in, mixing well**. This should give eight or ten inches of manure and soil **for the bottom of the bed**. Then return the topsoil, mixing a half pound of steamed bonemeal to a bushel of soil, but **add no more manure** as it will **rot the rose roots if it touches them**. The manure which was dug into the bottom of the bed will be decomposed and a part of the soil by the time the roots get down to it. This work should be done as far in advance of planting as possible (we hope you did it last fall!) so that the soil will be settled and firm by planting time.

If the beds are prepared just before planting, the soil should be tramped, to pack it, as it is being thrown in. Roses will not do well unless the soil is firmly packed around the roots. When the soil is settled a rose bed should be an inch or two higher than the surrounding surface.

Spacing Plants

There is no hard and fast rule for spacing. We have seen roses planted six inches apart, other roses planted thirty inches apart, both blooming prodigally. We like them best spaced 18 to 24 inches apart. Closer spacing makes it necessary to haul in soil for winter protection, wider spacing leaves them looking lonesome.

Planting Instructions

During the planting operations carry the roses in a bucket of water in which some clay soil has been dissolved. Make the "soup" thick enough so it will stick to the roots.

Make the hole in which the plant is to be set large enough so the roots can be spread down and out naturally. Spreading the roots when planting is important. Plants with cramped roots never do so well as those that have plenty of root room when set. Cut off bruised or injured roots, shorten over-long roots (**never** coil them around inside the hole) and cut the tips of others with a sharp knife.

Put the plant in position so the "bud" ("knuckle," "knob," "joint") is **not more than an inch below** the surface of the soil when planting is completed. **THIS IS IMPORTANT.** Time was when it was thought necessary to bury the bud six inches but successful modern rose planters set the bud right at ground level, or very slightly covered. Don't let it stick two or three inches above ground, either.

Work fine soil among and over the roots, gradually firming it down until the hole is almost full, when the soil should be stamped with the feet and made as compact as possible. Make absolutely certain the soil is firm around the roots. The depression thus made is then filled with water. After this has drained away, fill it again, and if there is any doubt that this has reached the lowest roots fill it the third time. Finish covering and leveling with loose soil and **do not tramp any more** after water has been applied.

To enjoy good roses **the canes must be cut back to about eight or ten inches**, even though you hesitate to cut away perfectly live, green wood. Good roses are produced on new shoots from near the base of the plant. This hard pruning refers to Hybrid Tea roses. Hybrid Perpetuals, Polyanthas and Climbers may be left longer.

Now comes probably the **most important point for rose insur-**

ance in our climate: After the branches have been pruned or cut back, draw up a mound or hill of soil to cover most of the branches. This is done to prevent drying out by wind and also injury by hard frost and thus gives the roots time to become established and working before tops are making excessive demands for food. This mound of soil must be removed within about two weeks when the eyes will begin to swell and grow; **remove it gradually on cloudy days.**

Summer Care

Your roses will need regular irrigation from now on, and more important, **regular cultivation.** Soak them thoroughly about every ten days; hoe them three times between each irrigation. If you do this you will never find your soil baked and hard, and you'll be surprised how quickly you can "go over" even a large bed of several dozen.

Feeding

During the first season commercial fertilizers should not be used, with the exception of a little bone-meal at planting time. Over-feeding has killed many newly planted roses. For established roses a handful of steamed bone-meal spread around each plant, not too close, and hoed in in August is always beneficial. Manure applied as outlined under "Winter Protection" is the best of all rose food.

How To Cut The Blooms

How to cut the blooms depends entirely on how you like them — if for low table arrangements cut short stems, if for vases cut long stems. The only rule that can be laid down is to leave at least two leaves on each stem so new flowering stems will start from each stub. Often heavy canes carrying large clusters of bloom will grow up to four feet or even taller. When the last

bloom has faded from one of these vigorous canes cut the whole thing back to 18 or 20 inches — this makes a neater, better shaped plant and longer stems on the next crop of flowers.

Roses will last longer if cut very early in the morning and conditioned for three or four hours in cool water up to their necks before arranging. At summer temperature above 80 degrees they never last long; keep them cool as possible.

Protecting Roses From Enemies

There are two diseases which attack roses. Mildew, which looks like its name, is likely to appear late in the summer and can be got rid of by spraying with wettable sulphur. Black-spot, a leaf disease, begins as blackish or purple spots on the leaf, enlarging rapidly and causing the leaf to become yellow and fall off.

Black-spot is incurable but its spread is effectively checked by a wettable sulphur spray once every 10 days (the same spray we use for mildew). Many other sprays and dusts have been recommended but wettable sulphur does the job most efficiently, with the least residue, and at lowest cost. Use one rounded tablespoonful per gallon of water—and be sure you have **wettable sulphur**, not drugstore “flowers of sulphur” or other coarsely-ground, cheap sulphur.

Aphids, or green plant lice, frequently cluster thickly over the tips and buds on new growth. They are destroyed by spraying with Black-Leaf 40 or Evergreen, two teapoons per gallon of water. Whip up a suds with a small handful of mild soap chips before adding Black-Leaf 40. Aphids seem to appear in waves; for awhile you may have to spray every five days, then you may go a month without seeing one. In severe infestations three thorough

sprayings 24 hours apart may be necessary but this will dispose of them for a long time.

The other class of insects damages the roses by eating the leaves or flowers. These can be poisoned; the best poison to use is arsenate of lead, one heaping tablespoon per gallon of water. Common sense will tell any rose grower when he sees a leaf or flower chewed by an insect that they should be sprayed at once.

Dealing with the Western Rose Curculio (“snout beetle,” “puncture bug”) isn’t so easy. Owing to their method of feeding, by puncturing flower buds and occasionally the stems below the buds, poison sprays are worth little. Careful, regular hand-picking and destruction of punctured buds, which may contain eggs, is the only effective control. A thorough cleanup of “hips” or seed pods of shrub roses in late winter will kill many larvae before they emerge. There is only one generation annually and they cause no trouble after midsummer.

Winter Protection

The best winter protection is to hill earth around the stems of the plants to a height of eight or ten inches. Then fill the hollows between the hills with barn or stable manure. There’s no need to hurry this job — the latter part of November is early enough. The bed will look neater and plants will be whipped less by winter winds if they’re cut back to a uniform height of 20 to 24 inches. **NEVER CUT THEM BACK TO SIX INCHES IN THE FALL** — to do so is to invite disaster. Be sure the ground is thoroughly wet before the roses are covered. Many roses are dried up by long periods of scant soil moisture in our Colorado winters. Freezing is in itself a drying process, making an ample reserve of soil moisture essential.

Climbing roses will come through about three winters out of five if merely wrapped with several thicknesses of burlap, but the surest way is to take the canes down from their support, bundle them together and cover completely with earth, always making sure that the base of the plant is well covered so that no cane is killed at that point.

Polyanthas as a class seem considerably hardier than Hybrid Teas and we no longer bother to cover them (that's just one more reason we love these cheerful little fellows!) Shrub roses, as their name implies, need no winter protection.

In the spring remove the coarse part of the manure and dig under what is left. Don't be in a hurry to uncover — it's better to be a little late than too early. Most years April 15 is about right. Do the uncovering on damp or cloudy days.

How To Prune Roses

More hokum has been broadcast about how to prune roses than most any other phase of rose culture. Pruning of established roses begins when the winter covering has been removed. The first and obvious thing to do is cut away the dead wood always found; here in Colorado that is about all the spring pruning that is necessary.

Only fresh, green wood should be left on the plant. All other stems should be taken away entirely, even if the plant is reduced to one or two bare stems. Take out all branches which cross and make all cuts clean, just above an "eye."

Hybrid Teas and Polyanthas bloom on shoots which grow during the year in which they arise,

sometimes from the bud at the surface of the ground. Hybrid Perpetuals, Climbers, and Shrub Roses, on the contrary, bloom only on shoots that come from wood of preceding years. These facts, once understood, guide all subsequent pruning.

Summer Pruning of Hybrid Teas, about which volumes have been written, is automatically taken care of if you grow roses primarily for cutflowers. Review the paragraph "How To Cut The Blooms."

The best time to prune Climbing Roses is **IMMEDIATELY AFTER THE PLANTS HAVE BLOOMED**. All the canes which have withered flowers on them may be cut out to the base of the plant, or to the point where a strong new cane springs from them. Healthy new shoots are trained up to take the place of branches which have been taken out. The object is to make a complete new plant each year above the ground.

The Shrub Roses need no pruning in the sense that other roses do. Each tends to have its own habit, either upright or scrambling or drooping, in a natural symmetry which shortening the growth would mar. It is sad to see the ravages of the pruning shears in ignorant hands upon such shrubs, grown primarily, not for special-purpose flowers like the garden varieties, but for the grace and distinction with which nature has endowed them!

As these shrubs grow, they gradually become tangled with canes that have long ago served their purpose. Without destroying the aspect of the plant, these can be cut away at the base, with the use of courage, sharp shears and a pair of heavy leather gloves.

PUZZLER

The following letter starts some interesting speculations. How many Green Thumb readers know of similar instances of plants found naturalized far from their natural range? The tamarix here mentioned has also naturalized itself along the Colorado below Grand Junction and in places along the Arkansas. So far as anyone has determined it is identical to the Kashgar tamarix (*Tamarix hispida*). Does anyone know of an early record of its occurrence wild in Colorado.

Charles Kelly has spent many years exploring the little known places along the Colorado, in the Four Corners country and throughout Utah. He is now custodian of the Capitol Reef National Monument in Utah and a writer of historical stories of the early Western pioneers.—Editor.

I AM not a botanist, but here is something that has been puzzling me for some time. Maybe some readers of The Green Thumb can furnish the answer.

A good many years ago I lived in Tennessee, where early in spring each year the redbud tree illuminated the dark oak forest with its brilliant pinkish-red blooms, contrasting with the creamy white dogwoods and delicate wild plum blossoms.

After moving to Utah, an occasional redbud, planted as a decorative shrub, reminded me of the great masses of blooms so much admired in the Tennessee hills, but they never seemed to develop

properly and appeared to lack somewhat in color. The reason for this was apparently because they were not native to western soil. Or so I thought.

Then I made a trip by boat down part of the Colorado river known as Glen Canyon, beginning at the mouth of the Fremont in Utah and ending at Lee's Ferry, Arizona. This was during the month of April. I could hardly believe my eyes when, turning a bend in the narrow canyon, there appeared a group of bright blooms near the base of the cliff which could be nothing else than the old familiar redbud. Pulling ashore this was verified by ex-



View taken in Music Temple (looking out) where members of Major Powell's Colorado river expedition cut their names in 1871. Most of the shrubs seen in this photo are redbud.



Navajo Mountain as seen from the Colorado river. Redbud grow along base of the cliffs back from shoreline.



Redbud growing along Colorado river prefer rocky talus slopes like that seen in shadow at left. Photo taken in Glen Canyon where redbud was in bloom April 15, elevation 3500 feet.

aming the heart-shaped leaves just beginning to form on some of the shrubs which here were the size of small trees. Other clumps of redbud decorated the canyon at intervals all the way to Lee's Ferry.

In this same canyon, on sandbars and along the water's edge, grow large groups of tamarix, a shrub not originally native to the Colorado. It is thought to have been first planted in gardens at Greenriver, Utah, and the seed carried downstream by floods. In some places it has almost supplanted the native willows, but has a certain beneficial effect in binding the loose sand and preventing too rapid erosion. Never having found the redbud anywhere else in Utah, it seemed logical to suppose that it also had been accidentally introduced to the Colorado river.

To check on this, I searched the records of Major Powell's expedition of 1869, which first penetrated the mysteries of the Colo-

rado. In one lone paragraph I found mention of redbuds, which proved they were native rather than introduced, and were there long before the first white men saw the Colorado.

So here is the puzzler: Why is the redbud found growing in the canyon of Colorado river, when it is found nowhere else, so far as I can learn, in any of the surrounding country or canyons?

I have not been able to ascertain just how far upstream or downstream this shrub extends, but do know that it is found along the river for 200 miles above Lee's Ferry, at an average elevation of 3500 feet. Have never seen it on Upper Green River or its tributaries, and have been told it does not appear in Grand Canyon. The fact of its being so apparently isolated and far from its native country has bothered me for a long time. Maybe some of you botanists can clear up the mystery.

—Charles Kelly.

SOME VERBAL BOUQUETS FOR THE GREEN THUMB

We know that some of our members are enjoying the bulletin for they tell us they are. Here are a few of their comments:

"What a nice magazine. I have always wondered why we did not have such a magazine."

"I enjoyed my copy of The Green Thumb very much and will be looking forward for future copies."

"The article on pruning was worth the price of the magazine."

"Having recently married a Colorado man, I am interested in the horticultural activities of your state, and so am pleased to receive a bulletin such as The Green Thumb."

"I fully endorse the objectives of your Association."

"The beautiful articles in this year's magazine are appreciated. Many thanks to contributors and editors."

"You have a magazine of which you may well be proud."

"The Green Thumb has been recommended as a grand horticultural magazine. I would appreciate a note on price, etc."

"... I am sending \$3 check to cover same. Only sorry I did not know of the publication before this."

"... With cordial interest in this valuable and important work and best wishes."

"I have enjoyed all issues of The Green Thumb. Please keep them coming."

SOME OBSERVATIONS ON PREFERENTIAL RATIONS OF LOCUSTS

By LESLIE F. PAULL

Here are some thought-provoking observations on the plants preferred by grasshoppers. Compare these notes with your own observations. It would be interesting to carry out these over a longer period of years and under a variety of conditions. Leslie Paull has been a student of horticulture for a great many years and has accumulated many experiences which we could all profit by sharing.—Editor.

Here are a few general conclusions after about three years of study of the "grasshopper problem."

It has been possible to make this study because of the accumulation on a third of an acre of several hundred species of plants. Before the war I kept the infestation very low by killing off most of the annual immigration from neighboring territory. Scarcity of suitable materials has increased the infestation. Grasshoppers are not strong for ersatz poison.

Even now infestation may be called moderate. The observations would be quite valueless in case of heavy infestation. Then the competition for just any food becomes so keen that likes and dislikes disappear, as does practically everything green.

It is not the place to record observations in detail, and even the conclusions are not final, but subject to correction.

1. Native plants are but little molested, but this does not apply to introduced weeds, which are often thought to be native because of wide distribution. Some of these are immune for other reasons.

2. All plants with milky juice are practically immune. Some latex contains rubber, and possibly there is enough in all plants with latex to justify the immunity.

3. There has been held a theory that plants have, in many cases, developed strongly scented glands as a protection against insect attack; yet Spearmint and Marigold are among the favorite foods of locusts.

4. They do not much care for grasses although we have more

different kinds than of almost any natural plant-group.

5. Possession of prickles, hair or the densest of woolly coverings does not necessarily protect plants from locusts.

6. In a few cases only floral parts or fruit (sometimes only ripening fruit) are considered palatable.

7. Species of the same Genus often present strange contrasts.

Lilacs — common and Persian practically immune: French hybrids, close at hand, stripped bare.

Colorado Dogwood, locking horns with Redtwig, the former untouched, but leaves, twigs and some of the bark stripped from the latter.

Siberian Pea-tree immune but the bush, *Caragana frutex*, was stripped.

Euonymus americanus and *E. alatus*, planted adjacent: the former was immune, the latter was stripped.

Mentha spicata and *M. piperita* are eaten to bare stems, but *M. canadensis* goes untouched.

8. Locusts love sun and heat. It is possible to save certain plants by removing them to shade, but many plants are not shade tolerant.

9. Locusts are extremely partial to citrus fruits, bananas and pineapples, even if partially decayed. These are ideal attractive agents in poisoned mash.

10. Hardly less attractive to them are their dead brethren, previously poisoned by a palatable mash. A secondary ring of the more recently deceased may sometimes be found around the fragments of the Borgian feast.

BOOK NOTES

By KATHRYN KALMBACH

Lilacs For America — Report of 1941 survey conducted by the Committee on Horticultural Varieties of the American Association of Botanical Gardens and Arboretums. Revised and corrected July, 1943. Published by, and available from, The Arthur Hoyt Scott Horticultural Foundation, Swarthmore College, Swarthmore, Pa., \$1.00 per copy. A "must have" for the lilac enthusiast.

* * *

A Synopsis of the North American Species of Delphinium by Joseph Ewan. Published as Vol. 2, No. 2, of University of Colorado Studies, and available from the University at \$1.00 a copy. A technical paper of interest to our botanists, prepared with Mr. Ewan's characteristic thoroughness and accuracy.

* * *

The Quest of American Life by George Norlin — another University of Colorado Studies, Vol. 2, No. 3, which will be of interest to many in this region. Published posthumously, this book is the last to come from the pen of the President of our State University from 1917 until his retirement in 1939. Dr. R. G. Gustavson says in a preface to the book, "The friends of Dr. Norlin will see in 'The Quest of American Life' an epitome of the life of their friend." Available from the University at \$1.00.

* * *

Hortus Second by L. H. Bailey —formerly \$12.00, now offered by Macmillan, the publishers, at \$5.00. A real bargain!

* * *

The World Of Plant Life by C. J. Hylander — another rare

bargain! Published in 1939 at \$7.95, now in its third printing, and offered by Macmillan at \$3.95. A grand book for expert and amateur alike — try and lay it down in less than a long winter evening's perusal!

* * *

Flower Folk by Anne Guthrie Bicknell — a book of sheer beauty and a fine Christmas suggestion for that young niece or nephew or grandchild — if you can bear to part with it! The illustrations, all in color, by Martina Grenwis, would make anyone believe in fairies. Published in 1936, but just discovered by your reviewer. Published by Putnam at \$2.50.

* * *

Mycophagy by Fred J. Seaver —an article in *Gourmet* for May, 1945, will be of interest to mushroom addicts, and the cover of this May number, in color, will make your mouth water! We believe a copy may still be had by sending 25 cents to *Gourmet*, Penthouse, Hotel Plaza, New York 19, N. Y.

* * *

Sundials — A valuable little pamphlet from "Uncle Sam," Bureau of Standards Circular No. 402, available from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., at five cents a copy.

* * *

Note to Colorado Green Thumbers — We are looking forward to that Reading Room in our own Arboretum, where we may browse among the great horticultural writings of the world!

DO YOU KNOW THESE PERIODICALS?

Agriculture In The Americas—

Only 75 cents a year from Uncle Sam! Again from Superintendent of Documents in Washington — to keep you up-to-date on the horticulture of our near neighbors to the South.

* * *

Journal Of The New York Botanical Garden —

\$1.00 per year from the Garden, Bronx Park, New York 58, N. Y. Every number is absorbing — read "Gentian Walk In A Canadian Garden" in the July, 1945, issue if you need proof.

* * *

Bulletin Of Popular Information—

Published by the Morton

Arboretum in Lisle, Illinois, at \$1.00 per year. We could almost be happy with this Bulletin and our arm-chair, for each number transports us quite literally to some delightful corner of Mother Nature's domain, with no effort on our part whatsoever!

* * *

Arnoldia —

Published by the Arnold Arboretum, Harvard University, Jamaica Plain 30, Mass., at \$1.00 per year (make checks to Harvard University). You will all want the May 18, 1945, number (Vol. 5, Nos. 5-7) entitled, "The Park Arboretum—How To Establish One As A Living War Memorial."

A CHILD'S GARDEN OF CHILDISH GARDEN VERSES

JOHN STOCKBRIDGE

If the Army wants to try
A small atomic bomb,
They may bust it in my Garden
Where it can't do any homb.

Note on Landscape Architecture

Near our Arches
We had some larches;
'Twixt our Pilasters
We planted asters;
But nobody knew
Why our Pergola grew!

A Tree grew on a river's bank
And gazed at its reflection.
It said, "My homeliness I thank—
"I'm not a Plant Selection."

I always favor any Movement,
For Art, or Culture, or Soil
Improvement,
And in another I'll enroll—
For weeds, I favor Birth Control.

We kept our Victory Garden neat
And grew both spinach and things
to eat.

My friend Benny frenzidly
Grew a garden for Victory.
When Nippin folded, so did he!

One time in a church I set my foot
And heard the minister say,
"A weed is a flower that God has
put
Where it seems to be in your
way."

My Garden is so well fenced in,
I think we should do that with
Sin.

I wish I were a compost heap,
Neglected and forgotten;
My value to the world I'd keep,
Altho my life were rotten.

For some smooth shavin' lotion
my face has long been itchin'
That's fragrant as the pickles now
cookin' in our kitchen.

I'm looking for some jitterbugs,
I want so much to see
If our protection from such lugs
Has come with DDT.

The dandelions in our lawn
Grow prettily and brightly.
But those our next-door neighbor
has
Are really most unsightly.

"Contractors' Soil"

THE SUCCESS or failure of a garden, be it vegetable or ornamental, probably depends more on the condition of the soil than any other factor. Moisture, insects, temperature, diseases, absence or excess amounts of certain chemicals, sunshine, protection, air and weeds all influence your garden's growth, but those plants which are growing in good soil will have a tendency to overcome many of these difficulties.

If you are moving on a new place and you have assigned a budget of \$200.00 for landscaping, you might well spend half this amount on improving or replacing the soil.

Lawns, vegetables, shrubs or flowers planted in good soil will not have to be given frequent "shots in the arm" with fertilizers to keep them growing. Good soils will usually contain everything that the wonder-working B1 might add.

Yet usually our soil is the most neglected item in our garden effort. Nine out of ten new homes have yards which are backfilled with lifeless subsoil from the bottom of the basement excavation, liberally mixed with plaster, brickdust, gravel, lime, old boards and rubbish of every kind. Especially in Colorado with her naturally alkaline soils is the presence of additional lime and plaster harmful. A good many cases of failure with climbing roses is because of the deposit of plaster just under the surface around the foundation.

It should be a criminal offense for any contractor to leave any of this rubbish on the ground, and care should always be taken that the surface soil removed is replaced back on the surface. Builders all know that almost everyone will want to plant lawns and a few trees at least around their house, yet it is seldom that any consideration is given to preserving a good soil in which plants may thrive. It is a wise idea to contact a landscape architect at the same time as the building architect is employed, so that such things as preserving the soil, grades and watering arrangements may be properly planned. It is true that many hardy things will manage to survive in this "contractors' soil" but they are subject to all the ills that may beset plant life. Dandelions flourish in this soil in which blue grass struggles for existence, yet they need be no serious problem in soil which is favorable for grass.

First of all then, let us preserve our good clean virgin soil; then, since this is Colorado, and most of our soils lack humus, let us mix with this soil all the manure, peat, leaf mould and compost that it will stand. Good, rich, pliable soil may be made from either a clay or sandy base if plenty of humus is added.

It has been demonstrated time and again that many "impossible" plants can be grown in soil which is properly prepared and cared for.



The Green Thumb

January — February, 1946

~~~~~ THE GREEN THUMB ~~~~~

A Bulletin of the

COLORADO FORESTRY AND HORTICULTURE ASSN.

Organized in 1884

George W. Kelly, Editor

L. C. Shoemaker, Office Manager

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"To preserve the natural beauty of Colorado; to protect the forests; to encourage proper maintenance and additional planting of trees, shrubs and gardens; to make available correct information regarding forestry, horticultural practices and plants best suited to the climate; and to coordinate the knowledge and experience of foresters, horticulturists and gardeners for their mutual benefit."

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VOL. III

NO. 1

EDITORIAL

How does the close of the war affect horticulturists? It finds most of our gardens more or less neglected. As we can again get help and materials we will need to catch up on those things which should be done.

Check trees, shrubs and perennials for those which are crowding and being crowded. You may have to be ruthless in weeding out rampant plants which are damaging better things. We will have to realize that plants do grow and mature, and many times the only solution to these crowding problems is to cut out the plant and put in a smaller younger one.

Seedlings of elm and boxelder will start in odd corners and under shrubs. They grow up so slowly that they may damage valuable plants before discovered.

Weeding, cultivating, trans-

planting and edging will usually be needed.

Look carefully for signs of the beginning of damage by insects and disease; especially scale insects on elm, ash, dogwood, lilac and cotoneaster.

Most large trees will need going over, especially to check up on broken limbs, rubbing limbs, old stubs and too-heavy limbs.

Most gardens and lawns will be benefited by applications of manure, peat, leaf mould and such.

Some lawns will need to be renewed. If too far gone the cheapest thing is to spade them up and reseed. When you prepare the ground this time, do it right and spade under a lot of manure.

Elsewhere in this issue you will find suggestions made by horticulturists who are experts in various things.

EVERGREENS—THEIR SELECTION AND CARE

BY ROBERT E. MORE

The beautiful Colorado Spruces Mrs. Jones put on each side of the front door of her little bungalow six years ago are now completely out of scale. They tower above the house, encroach on the front walk, and block the view from the front windows. They grow eighteen inches to two feet higher each year. And red spider and brown aphids got into her Junipers and Redcedars last summer, so that instead of healthy, virile, green trees, she now has sickly, moth-eaten, brown monstrosities that will gradually sicken and die — if she permits them to remain. But an Eastern catalog, with gorgeous pictures, came to her through the mail last year, and she ordered a Hemlock sent across the country. The nursery feared this long journey by freight, and since Mrs. Jones gave no specific shipping instructions, the tree was sent to her by express. The transportation bill was stupendous, but when the crate was finally removed, the delicate beauty of the Hemlock's lacy foliage made Mrs. Jones forget all—until it died the following April.

There were three essential things Mrs. Jones should have known:

1. Are my Evergreens hardy in Colorado?
2. What are their growth habits?
3. What care shall I give them?

It will be the purpose of this series of articles to answer these questions. In this first article general matters pertaining to all types of Evergreens will be discussed. Then, in subsequent articles, particular Evergreens suitable for Colorado landscaping will be reviewed.

The discussion will be confined to the Coniferus (cone-bearing) Evergreens. The "broad leaf" Evergreens, like Mahonia, Kinnikinnick, Ceanothus, etc., will not be included.

First of all let us talk about the weather: Contrary to popular belief, Colorado is a very difficult place to grow many types of Evergreens. Not only does the temperature frequently go down to twenty degrees below zero, or more, but, more important, in the spring there are alternate freezes and thaws and a great deal of wind. Much winter killing is due to the factors last named. An Evergreen that is protected from wind and can remain in frozen ground all winter seldom suffers injury.

Mulches, therefore, are not intended to keep the ground from freezing, **but to keep the ground frozen.** For this reason, when we speak of a "protected location" we mean a spot on the east or north side of some structure or screen which protects from spring winds and the spring sun in the afternoon.

In addition to the factors just mentioned, Colorado soil is frequently very difficult. Most Evergreens prefer a rather open soil, and one that is at least not alkaline. In many parts of Denver we find a clay that is anything but porous, and, except in the mountains, Colorado soil is inclined to be alkaline.

We can't therefore, even with tough natives like the Colorado Spruce and the Ponderosa Pine, simply stick them in anywhere. With strangers from other places, like Mugho Pines, Eastern Redcedars, Larches Eastern White Pines, and many others, even more careful thought must be given to making our visitors feel "at home."

Aside from the particular factors first mentioned, every Evergreen must have a moderate amount of sunlight, adequate drainage, sufficient moisture, and freedom from downtown smoke. The Evergreens on the old Courthouse Square will never do more than barely exist, because of the smoke they are subjected to.

Let us consider these matters in more detail. How about soil? And sun? Go to one of the older parts of town where little thought has been given to landscaping recently. Huge maples, elms and cottonwoods line the parking, with roots hungrily seeking food and water for great distances. The builder of thirty years ago always used for backfill the chunks of wood, the pieces of brick and the drippings of mortar that otherwise would have to be carted away. A few tough shrubs have continued to live in these surroundings for many years, and our householder now decides he wants a nice foundation planting of Evergreens. It can't be done — at least without spending a great deal of money. The Evergreens will either die, one after another, or at best soon become sickly, spindly things that are a reproach to the owner.

On the other hand, look at the bungalow that is built in the new subdivision, which was open prairie until a year ago. Before construction is started the top four inches of soil is scraped in a pile, and then when the bricks and lime are carted away and the grading is finished, this precious top soil is spread again. A load of old manure is spaded in also. The same nursery supplies the same kind of trees it sold to our friend under the elms but where those languished, these leap. If they are chosen indiscriminately they are out of hand in five years.

The Park Hill clay is not ideal. But in a new area, if unpolluted by contractors, and if broken up with cow or sheep manure, or even peat

moss, it is suitable for any Evergreen that is hardy in this climate. If you live under twelve-inch trees — any kind — especially if little care has been given the soil for many, many years and digging turns up all manner of surprising solids, then don't expect much unless you remove the competition and brace up the soil, and let the sun get at your Evergreens for several hours a day.

Besides soil and sun, watch drainage and water. We see a Rocky Mountain Juniper on a dry, rocky south slope in Deer Creek, perfectly happy during a year in which there is little or no rain, yet a similar tree, when given several times as much water in cultivation, dies from drought. The roots of the native have expanded naturally for years, running between cool rocks and seeking out the areas where moisture collects. The nursery tree has its whole root system in a 30-inch ball, and that ball is placed on an elevation where all surface moisture drains away from the tree.

Conversely, another *Scopulorum* Juniper is placed in a depression in the back yard, where all surface waters collect, with the result that the tree always has "wet feet." It will soon die.

A newly planted Evergreen needs lots of water during the first year. It must be so located that water will neither instantly drain from the roots, nor constantly collect about them. Good sunlight, freedom from severe competition, virgin porous soil, and, perhaps, love and affection, all guarantee a healthy and happy tree.

We have the following letter from J. Lee Deen, Dean of Division of Forestry and Range Management, Colorado A. & M. College, Fort Collins, Colo.:

"We have a number of copies of 'Evergreens of Colorado' by Professor Longyear, which was published by this institution a few years back. We believe that they should be sent out into the hands of people who appreciate and use such publications, and in our judgement, members of the Colorado Forestry and Horticulture Association are such people. We will mail them out to members of the Association without charge as long as the supply lasts. All we need is a card or letter to the Division of Forestry and Range Management, Colorado A. & M. College, Fort Collins, Colo., requesting that a copy be sent them."



Spruce Hedge at Upton Gardens, Colorado Springs

HEDGES FOR COLORADO

We have for several months been checking information on hedges for various uses and places in Colorado. Horticulturists all over the state have been giving freely of their experiences. We list below the results of this survey, dividing the plants used into classes as to size and use. This general list will apply in most cases to plant zones, 1, 2, 4, 5, 6, & 8. Additional lists of exceptions for zones 3, 7-9, 10-11, and 12-13-14-15 are also given. In many of these last zones there are small protected valleys where almost any of the plants in the general list may be grown successfully.

The most valuable quality of a plant to make it suitable for use as a clipped hedge is that of freely branching when sheared. The accompanying drawings show what happens when a privet hedge is sheared. Below each cut two new stems sprout out in place of the one cut off. Thus the oftener sheared the denser the hedge becomes. Privet is the best example of this but lilac, cotoneaster, Russian olive and many others have

that quality in a lesser degree. Plants which only send up new shoots from the ground are not suitable for sheared hedges. The *amorpha* is a good example. That is one reason why there are less barberry hedges being planted.

Other valuable qualities of a hedge plant are: rate of growth, color of leaves, length of time leaves stay on, hardness of plant, ease of transplanting, initial cost and ease of trimming. Almost any shrub which is hardy in the area, is of the desired size and is fairly dense and symmetrical will make a good informal or untrimmed hedge.

Mrs. Marriage has written some observations about trimmed hedges. Mr. More has called attention to some outstanding hedge material and both have supplied several good illustrations. Frances White has made a drawing showing several qualities of a good hedge. We solicit further information from any reader who has had experience with hedges in any part of the state.

In the following lists will be included all those plants which have been reported as having been used for hedges. Some plants have not been used as much as they should have been. These we have marked with an *.

"Standardized Plant Names" has been used as a guide in selecting the names used here. 'Cl.' indicates a clon, which is usually a sport propagated from cuttings or grafts. 'Hv.' indicates a horticultural variety, which may be a hybrid or selection.

FORMAL OR CLIPPED. TALL, 4-8 FT.

(Listed approximately in order of votes received)

- **Elaeagnus angustifolia*, RUSSIAN OLIVE. Hardy, drought resistant.
- Ulmus pumila*, SIBERIAN ELM. Hardy, drought resistant.
- Caragana arborescens*, SIBERIAN PEASHRUB. Hardy, drought resistant.
- Lonicera tatarica*, and others, BUSH HONEYSUCKLE. Drought resistant.
- Gleditsia triacanthos*, HONEY LOCUST. Hardy, drought resistant.
- Ligustrum vulgare* and varieties, EUROPEAN PRIVET. Almost evergreen.
- Ligustrum amurense*, AMUR PRIVET. Not as good foliage.
- Rhamnus cathartica*, COMMON BUCKTHORN. Thorny and dense.
- Syringa vulgaris*, COMMON LILAC. Coarse, hardy, suckers.
- Syringa chinensis*, CHINESE LILAC. Finer foliage and stems.
- Syringa villosa*, LATE LILAC. Slow growing, coarse.
- Syringa josikaea*, HUNGARIAN LILAC. About as above.
- **Crataegus intricata*, THICKET HAWTHORN. Dense, thorny.
- **Crataegus mollis* DOWNY HAWTHORN. Larger and coarser.
- **Crataegus oxycantha*, ENGLISH HAWTHORN. Finer and more tender.
- Crataegus crusgalli*, COCKSPUR HAWTHORN. Low and broad.
- Morus alba tatarica*, RUSSIAN MULBERRY. Somewhat tender.
- Tamarix hispida*, KASHGAR TAMARIX, Tall and thin.
- **Acer ginnala*, AMUR MAPLE. Beautiful fall color.
- Acer campestre*, HEDGE MAPLE. Not as hardy.
- Forestiera neomexicana*, NEW MEXICAN FORESTIERA. Hardy.
- Fontanesia fortunei*, FORTUNE FONTANESIA. Tall and slim.
- Philadelphus coronarius*. SWEET MOCKORANGE. Tall and slim.
- Prunus americana*, AMERICAN PLUM. Coarse, hardy, suckers.
- Salix pentandra*, LAUREL WILLOW. Large, fast growing.
- Shepherdia argentea*, SILVER BUFFALOBERRY. Gray foliage.
- Viburnum lentago*, NANNYBERRY VIBURNUM. Tall, neat.
- Viburnum dentatum*, ARROWWOOD VIBURNUM. Tall, neat.
- Viburnum lantana*, WAYFARINGTREE VIBURNUM. Dense, spreading.

EVERGREENS

- Juniperus scopulorum*, ROCKY MOUNTAIN JUNIPER. Tall, dense.
- Juniperus virginiana*, EASTERN REDCEDAR. Better in shade.
- Juniperus monosperma*, ONESEED JUNIPER. Hardy, lower.
- Picea pungens*, COLORADO SPRUCE. Coarse, slow growing.
- Picea glauca densata*, BLACK HILLS WHITE SPRUCE. Dense, uniform.
- Pinus cembroides edulis*, COLORADO PINYON PINE. Slow, low.
- Pinus aristata*, BRISTLECONE PINE. Slow, dense.
- Russianolive, Siberian Elm, Mulberry and Honeylocust are all used for extra large effects, and are all very hardy in difficult places.

FORMAL OR CLIPPED. MEDIUM, 1½-6 FT.

- **Ligustrum vulgare*, EUROPEAN PRIVET. Still the most popular.
- ***Ligustrum vulgare*, Cl. POLISH PRIVET, Improved.
- ***Ligustrum vulgare*, Cl. THOMPSON PRIVET. Best color.
- Ligustrum amurense*, AMUR PRIVET. Not as good color or habit.
- **Cotoneaster acutifolia*, PEKING COTONEASTER. Good.
- Spiraea vanhouttei*, VANHOUTTE SPIREA. Better untrimmed.
- Spiraea arguta*, Hv. GARLAND SPIREA. Stands trimming well.
- Spiraea thunbergi*, THUNBERG SPIREA. Not as good as *arguta*.
- Spiraea prunifolia*, Cl. DOUBLE BRIDALWREATH. Good.
- Philadelphus lemoinei*, LEMOINE MOCKORANGE. Dense and formal.
- Berberis thunbergi*, JAPANESE BARBERRY. Better untrimmed.
- **Berberis thunbergi*, Cl. TRUEHEDGE COLUMNBERRY. Very good.
- Berberis thunbergi atropurpurea*, REDLEAF JAPANESE BARBERRY.
- Berberis mentorensis*, MENTOR BARBERRY. Usually hardy.
- Physcarpus opulifolia*, Hv. DWARF NINEBARK. Very good.

FORMAL, MEDIUM CONT'D.

- Lonicera maximowiczii ^{sachalinensis}, SAKHALIN HONEYSUCKLE.
Cornus stolonifera coloradense, COLORADO REDOSIER DOGWOOD.
Cornus paniculata, GRAY DOGWOOD. Neat and compact.
Ribes alpinum, ALPINE CURRANT. Needs little trimming.
Rhus trilobata, SKUNKBUSH SUMAC. Good for dry places.
*Salix purpurea, PURPLEOSIER WILLOW. Neat and dense.
Malus transitoria, TIBETAN CRABAPPLE. Slow, thorny.
Shepherdia argentea, SILVER BUFFALOBERRY. Suckers from roots.
Symphoricarpos chenaulti, Hv. CHENAULT CORALBERRY.
Artemisia abrotanum, OLDMAN WORMWOOD. For dry places.

EVERGREEN

- Juniperus monosperma, ONESEED JUNIPER. Needs little trimming.
Pinus mugo mughus, MUGHO SWISS MOUNTAIN PINE. Coarse.
*Juniperus chinensis, Cl. PFITZER JUNIPER. One of the best.
Juniperus sabina vonehron, Cl. VONEHRON JUNIPER. Good color.
Juniperus virginiana, EASTERN REDCEDAR. Stands some shade.

FORMAL OR CLIPPED. LOW, 6-24 IN.

- *Ligustrum vulgare lodense, Cl. LODENSE EUROPEAN PRIVET. Best.
Caragana pygmaea, PYGMY PEASHRUB. Poor winter appearance.
Ribes alpinum, ALPINE CURRANT. Easy to trim.
Berberis thunbergi, JAPANESE BARBERRY. Does not trim well.
Berberis thunbergi atropurpurea, REDLEAF JAPANESE BARBERRY.
Potentilla fruticosa, BUSH CINQUEFOIL. Ragged in winter.
Symphoricarpos albus, COMMON SNOWBERRY. Suckers.
Euonymus alatus, WINGED EUONYMUS. Good fall color.
Euonymus nanus, DWARF EUONYMUS. Low and dense.

EVERGREEN

- *Juniperus sabina, Cl. TAMARIX JUNIPER. Best for low hedges.

INFORMAL or unsheared. TALL, 4-10 FEET

Practically all those plants mentioned under "Formal, Tall" and in addition the following:

- Viburnum prunifolium, BLACKHAW VIBURNUM. Neat.
Viburnum trilobum, AMERICAN CRANBERRYBUSH VIBURNUM. Red fruit.
Viburnum opulus, EUROPEAN CRANBERRYBUSH VIBURNUM. Red fruit.
Betula fontinalis, WATER BIRCH. Tall and spreading.
Acer glabrum, ROCKY MOUNTAIN MAPLE. Neat.
Acer tataricum, TATARIAN MAPLE. Little known.
*Crataegus coloradensis, COLORADO HAWTHORN. Good fruit and foliage.
Crataegus phaenopyrum, WASHINGTON HAWTHORN. Neat foliage.
Crataegus monogyna, SINGLESEED HAWTHORN. Similar to English.
Amelanchier various, SERVICEBERRY. Slow growing.
Euonymus atropurpureus, EASTERN WAHOO. Attractive fruit.
Euonymus europaeus, EUROPEAN EUONYMUS. Taller.
Prunus cistena, Hv. PURPLE PLUM. Lower, spreading.
Prunus blireiana, Hv. NEWPORT PLUM. Taller.
Prunus tomentosa, MANCHU CHERRY. Good flower and fruit.
Prunus triloba, FLOWERING PLUM. Attractive double flowers.
Prunus virginiana demissa, WESTERN CHOKECHERRY. Hardy.
Kolkwitzia amabilis, BEAUTYBUSH. Loose and spreading.
Physocarpus opulifolius, COMMON NINEBARK. Coarse.
Philadelphus various, MOCKORANGE. White flowers.
*Sorbus sambucifolia, WESTERN MOUNTAINASH. Good fruit.
Salix irrorata, BLUESTEM WILLOW. Colored twigs.
Sambucus various, ELDER. Loose and spreading.
Maclura pomifera, OSAGEORANGE. Not hardy in places.
Populus alba, Cl. BOLLEANA POPLAR. Tall, quick growth.

Other tall shrubs hardy in the area.

INFORMAL or Unsheared. Medium, 1½-6 FEET.

The following mentioned under formal, are also especially suitable for informal use:
Cotoneaster acutifolia, PEKING COTONEASTER. Dark green foliage.

- *Spiraea vanhouetti, VANHOUTTE SPIREA. Still the most popular.
Berberis thunbergi, JAPANESE BARBERRY. Red berries in winter.
Physocarpus opulifolia, Hv. DWARF NINEBARK. Good all year.
*Ribes alpinum, ALPINE CURRANT. Naturally formal.
Spiraea arguta, GARLAND SPIREA. Dense symmetrical.
Spiraea thunbergi, THUNBERG SPIREA. Lower.

INFORMAL, MEDIUM CONT'D.

- Euonymus alatus*, WINGED EUONYMUS. Compact, fine fall color.
**Philadelphus lemoinei*, LEMOINE MOCKORANGE. Naturally formal.
Rhus trilobata, SKUNKBUSH SUMAC. For dry places.
Cornus stolonifera coloradensis, COLORADO REDOSIER DOGWOOD.
**Berberis thunbergii*, Cl. TRUEHEDGE COLUMNBERRY. Formal, erect.
Artemisia abrotanum, OLDMAN WORMWOOD. Very hardy.
**Salix purpurea*, PURPLEOSIER WILLOW. Dense and dainty.
Caragana pygmaea, PYGMY PEASHRUB. Neat in summer.

In addition the following:

- Ligustrum obtusifolium regelinum*, REGELS BORDER PRIVET.
Rhodotypus scandans, BLACK JETBEAD. Needs some shade.
Symphoricarpos albus, COMMON SNOWBERRY. Suckers from roots.
Symphoricarpos orbiculatus, INDIAN CURRANT CORALBERRY.
Cercocarpus montanus, MOUNTAIN MAHOGANY. For dry places.
Chaenomeles japonica, JAPANESE FLOWERING QUINCE. Slow.
Exochorda racemosa, COMMON PEARLBUSH. Loose.
Holodiscus dumosus, BUSH ROCKSPIREA. For all dry slopes.
Ribes americanum, AMERICAN BLACK CURRANT. Tolerates shade.
Ribes cereum, WAX CURRANT. Red fruit. Dry slopes.
Ribes aureum, GOLDEN CURRANT. Suckers from roots.
Rubus deliciosus, BOULDER RASPBERRY. White flowers.
Prunus glandulosa rosea, Cl. Double-pink ALMOND CHERRY.
Prunus besseyi, BESSEY CHERRY. Spreading.
Ligustrum ibota, IBOTA PRIVET. Sometimes tender.
Rosa hugonis, FATHER HUGO ROSE. Single, light yellow.
Rosa setigera, PRAIRIE ROSE. Pink, spreading.
Rosa harisoni, Hv. HARISON YELLOW ROSE.
Rosa persiana, PERSIAN YELLOW ROSE. Darker yellow.
Rosa foetida bicolor, AUSTRIAN COPPER ROSE. Striking color.
Berberis mentorensis, MENTOR BARBERRY. Usually hardy.
Lonicera syringantha, LILAC HONEYSUCKLE. Wide spreading.
Lycium halimifolium, MATRIMONYVINE. For "impossible" places.
Symphoricarpos chanaulti, CHENAULT CORALBERRY. Dainty.
Rosa blanda, MEADOW ROSE. Red stems. Pink flowers.
Caragana aurantiaca, DWARF PEASHRUB. Large yellow flowers.

EVERGREEN

- Juniperus chinensis*, Cl. PFITZER JUNIPER. Good color.
Pinus mugo mugus, MUGHO SWISS MOUNTAIN PINE. Formal habit.

INFORMAL. LOW. 6-24 IN.

Those listed under: "Formal, low" and in addition the following:

- ***Rosa* Hv. FLORIBUNDA ROSES. Bloom all summer.
Spiraea bumalda, Cl. FROEBEL SPIREA. Kills back in winter.
Spiraea bumalda, Cl. ANTHONY WATERER SPIREA. Lower.
Symphoricarpos orbiculatus, INDIAN CURRANT CORALBERRY. Red fruit.
Symphoricarpos chenaulti, CHENAULT CORALBERRY. Partly tender.
Lonicera heckrotti, Hv. GOLDFLAME HONEYSUCKLE. Good.
Yucca glauca, SMALL SOAPWEED. Evergreen.

Of course there are many low perennials which may be used for borders, but more low shrubs suitable for formal or informal use are needed. Who has some to suggest?

DROUGHT-RESISTANT PLANTS FOR FORMAL OR INFORMAL HEDGES IN ZONES 7 & 9 (Plains)

(Roughly in order of size and hardiness)

RUSSIAN OLIVE	AMERICAN PLUM	CORALBERRY
SIBERIAN ELM	PEKING COTONEASTER	JAPANESE BARBERRY
HONEYLOCUST	SKUNKBUSH SUMAC	BUSH CINQUEFOIL
SIBERIAN PEASHRUB	VANHOUTTE SPIREA	LEADPLANT AMORPHA
KASHGAR TAMARIX	GOLDEN CURRANT	ALPINE CURRANT
COMMON BUCKTHORN	MOUNTAIN MAHOGANY	BESSEY CHERRY
WESTERN CHOKECRERRY.	SHRUB ROSES	ROCKY MOUNTAIN JUNIPER
BUSH HONEYSUCKLE	MATRIMONYVINE	ONESEED JUNIPER
COMMON LILIC	BUSH ROCKSPIREA	MUGHO SWISS MOUNTAIN PINE
CHINESE LILAC	INDIGOBUSH AMORPHA	
SILVER BUFFALO-BERRY	WAX CURRANT	
	COMMON SNOWBERRY	SMALL SOAPWEED
	INDIAN CURRENT	

ZONE 3

Most of those listed for zones 7 and 9 and in addition:

WESTERN SOAPBERRY

WALKINGSTICK
CHOLLA

COLORADO PINON PINE

And in southern canyons many natives of New Mexico and Texas.

ZONES 10 & 11. Southwestern Colorado

In much of the San Luis Valley the BUSH HONEYSUCKLE is the main plant used for clipped hedges. The high water table and other peculiar conditions prevent the use of many other plants. Under favorable conditions many of the plants in the main list may be used, but the following have been in more general use:

Also these natives

SIBERIAN ELM
RUSSIAN OLIVE
COMMON LILAC
VANHOUTTE SPIREA
EUROPEAN PRIVET
AMUR PRIVET
RUSSIAN MULBERRY
WESTERN CHOKE-
CHERRY

ROCKY MOUNTAIN
MAPLE
HACKBERRY
SILVER BUFFALOBER-
RY
NEW MEXICAN FOR-
ESTIERA
WESTERN CHOKE-
CHERRY

COLORADO REDOSIER
DOGWOOD
NATIVE WILD ROSES
HOPTREE
SMITH BUCKTHORN
CLIFF FENDLERBUSH
WESTERN MOCK-
ORANGE
APACHEPLUME

ZONES 12-13-14-15, MOUNTAINS

Conditions will vary in these zones from small protected valleys where almost anything in the main list may be grown to timberline, where only a few plants survive. Around timberline about all that will grow are the native BUSH CINQUEFOIL, Native CURRANTS and dwarfed specimens of Engelman Spruce, Bristlecone Pine, Alpine Fir and Limber Pine.

For much of the inhabited parts of the area the following are good suggestions:

ONESEED JUNIPER
UTAH JUNIPER
RUSSIAN OLIVE
COMMON LILAC
CHINESE LILAC
BUSH HONEYSUCKLE
ALPINE CURRANT
OLDMAN WORMWOOD
HARISON YELLOW
ROSE

PURPLEOSIER WILLOW
PYGMY PEASHRUB

And these natives:

COLORADO REDOSIER
DOGWOOD
AMERICAN PLUM

COLORADO HAW-
THORN
SHRUB WILLOWS
WILD GOOSEBERRIES
BUSH CINQUEFOIL
SNOWBERRIES
WESTERN MOUNTAIN
ASH
BUNCHBERRY ELDER
SERVICEBERRY
MOUNTAIN MAHOGANY
BUSH ROCKSPIREA
WAX CURRANT
BOULDER RASPBERRY
BESSEY CHERRY
WILD ROSES

THINLEAF ALDER
MYRTLE PACHISTIMA
ANTELOPE BITTER-
BRUSH
BOG BIRCH
CLIFF JAMESIA
MOUNTAIN NINEBARK
SNOWBRUSH CEANO-
THUS
INLAND CEANOOTHUS
RUSSET BUFFALO-
BERRY
BEARBERRY HONEY-
SUCKLE
FENDLER CEANOOTHUS



Truehedge Columnberry Hedge

Photo by Robert E. More



Hedge of Black Hills Spruce—Residence of Hon. Lawrence C. Phipps
Hedge of Rocky Mountain Juniper—Residence of Allan R. Phipps



OBSERVATIONS ON HEDGES

BY ROBERT E. MORE

CLIPPED—TALL

A—Deciduous

- (1) European Privet *LIGUSTRUM VULGARE*. Very fine in every way.
- (2) Vanhoutte Spirea, *SPIRAEA VANHOUTTEI*. Makes a splendid compact hedge.
- (3) Russianolive, *ELAEAGNUS ANGUSTIFOLIA*. If pruned regularly (see the fine one at Harry Huffman's place) it is very good, at least for ten years. If neglected (see Denver Country Club) gets ragged and spotty soon.

B—Evergreen

(1) Black Hills White Spruce, *PICEA GLAUCA DENSTATATA*. I believe this makes the best formal evergreen hedge for Colorado. The tree is naturally dense, shears well and is very uniform in color and texture, making grafts unnecessary. There is apparently uniformity of growth in different trees, also.

(2) Oneseed Juniper *JUNIPERUS MONOSPERMA*. I believe it to have fine possibilities. Of course uniform grafted specimens should be used for most evergreen hedges. The use of grafts on this species will probably result in one-stemmed specimens that will stand snow better. This is the most serious shortcoming of this tree in a formal hedge. While not as compact as *J. SCOPULORUM* it maintains foliage better on shady side so is more uniform when both sides are considered.

(3) Eastern Redcedar, *JUNIPERUS VIRGINIANA*. Have seen no hedges in Denver, but believe they would be better than *J. SCOPULORUM* because the tree stands shade better. A hedge of Canaert Junipers would be stunning.

(4) Rocky Mountain Juniper, *JUNIPERUS SCOPULORUM*. Not satisfactory for the average private house because bottom is inclined to thin when crowded and red spider or aphid usually complete the job of depleting foliage. If regularly sprayed and fed it results in a fine hedge, as shown in the picture from home of Allan B. Phipps.

(5) Bristlecone Pine, *PINUS ARISTATA*. As shown by the pictures of the seven-foot hedge at the house of Allan R. Phipps, the Bristlecone can be used for an informal hedge. By shearing the candles an effective clipped hedge would be possible. The tree is slow growing, which gives it an advantage over other pines.

(6) Colorado Spruce, *PICEA PUNGENS*. Needs expert care so would not be recommended for average place. That seen at Upton Gardens shows that a very fine formal hedge is possible.

CLIPPED—MEDIUM

My first choice is Truehedge Columnberry, *CLON OF BERBERIS THUNBERGI*—Plant patent No. 110. It has beautiful foliage in summer which is held late and turns a beautiful red in fall. It has handsome berries. It is full and yet trim, and makes an effective barrier because of its thorns.

The three already mentioned under the larger group could all be kept within this group for a good many years by clipping. Dwarf Ninebark, *CLON OF PHYSOCARPUS OPULIFOLIUS* is fine.

CLIPPED—LOW

- (1) Truehedge Columnberry.
- (2) European Privet.

INFORMAL—TALL

A—Deciduous

(1) European Privet. Its almost evergreen characteristic, its thick foliage and its berries make this a fine hedge.

(2) Vanhoutte Spirea. When not clipped its superb floral display is presented in the spring.

(3) The usual group of Viburnums, Lilacs, Honeysuckles, etc.

B—Evergreen

Since hedges cannot be easily removed when they get too large, I feel that few Evergreens are practicable when unrestrained. The Bristlecone Pine is probably the slowest growing of those previously mentioned. The most striking unclipped evergreen hedge I have seen, however, is the one of Pfitzer Chinese Junipers. Clon of *JUNIPERUS CHINENSIS* at the home of Mr. Van Houten. I think they will get out of hand horizontally soon, but they are gorgeous at present.

INFORMAL—MEDIUM

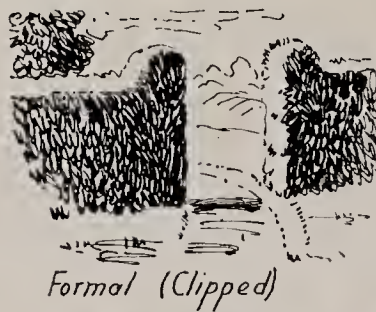
- (1) Truehedge Columnberry.
- (2) Dwarf Ninebark. Retains foliage.
- (3) Jetbead, *RHODOTYPOS SCANDENS*.

INFORMAL—LOW

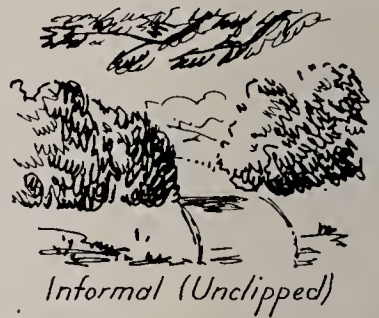
Dwarf Peashrub, *CARAGANA AURANTIACA*.

Of course there are many other fine hedges, but I have mentioned only those I am personally familiar with.

HEDGE TYPES

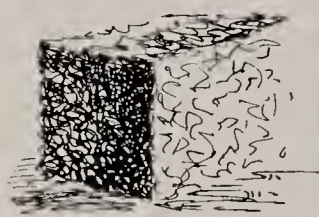


Formal (Clipped)

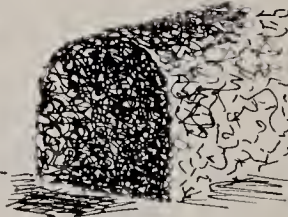


Informal (Unclipped)

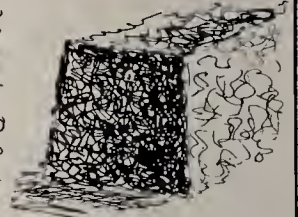
HEDGE SHAPES



Usual



Better



Best

HEDGE CUTTING



Plant



Cut Down



First Growth

INCORRECT CUTTING



If cut too late or too long—

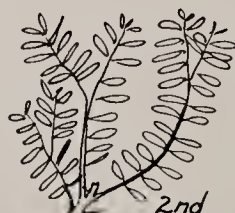


Bare stem, broom above

WHAT HAPPENS WHEN A PRIVET HEDGE IS SHEARED



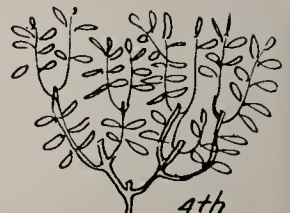
1st



2nd



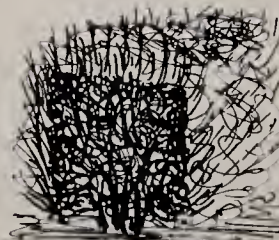
3rd



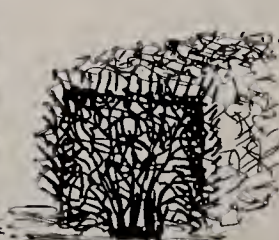
4th

New Growth is Doubled with each Shearing

HEDGE TRIMMING



Don't wait too long



Trim new growth



After Trimming

FRANKS A. WHITE



Informal Hedge of Bristlecone Pine—Residence of Allan R. Phipps

TRIMMING HEDGES

By Kathleen Marriage, Colorado Springs, Colorado

Formal hedges, whatever their plant material, their ultimate height or width, seem best when trimmed soon after new growth has well got under way in summer—usually as soon as the hedge begins to look a bit shaggy and ready for the barber. Shearing at this time allows, even in slow-growing plants, time for the hedge to make enough new tips to get it over the stubbornness of its new haircut.

How often to trim? All Green Thumb people know and can tell the world that a new hedge must be kept shorn low until it has the required width and density at the base. Impatience for height is the ruin of many hedges, for if there is one common requirement for all

hedges it is that they be dense and light-excluding at the bottom.

How to trim? When a hedge has attained the required height and width, trim to keep it to this size. The greatest increase is always at the tips so the upper part of any hedge endangers the lower part by overshadowing it, keeping light and moisture from it.

Thus it is wise to keep the top of a formal hedge an (imperceptible) few inches narrower than the base. "Imperceptible" here is intentional, for occasionally we see where some amateur topiarist has brought the top of his hedge to form the apex of a triangle. This device makes the hedge too obvious, gives it the appearance of being the picture instead of merely the frame.



WALTER H. SCHRADER

Walter H. Schrader, a pioneer in governmental nursery development in the Rocky Mountain region, was born December 16, 1883, in the log cabin home at Valley View. He attended the country school on Pinos Creek, a hike of several miles from the ranch, from the time he was seven years old until he was thirteen; then worked on the ranch until the summer of 1899. By that time he thought the time had come to move on, so he ran away from home and did not return for three years. He first went to Salida, then to Denver and other towns in Eastern Colorado where ranch work, all he knew, was to be found. In 1903, he was working at Montrose, and attended the Oak Grove School there during the winter. After that was over, he drifted to Northern Colorado and worked on a sugar beet ranch near Windsor.

Nearness to Fort Collins and contact with successful farmers stimulated his interest in scientific farming and fruit growing, and he sent to the State Agricultural Col-

lege at Fort Collins for information about the short course given there each winter. His educational background proved to be insufficient to meet the requirements for admission, and the entrance examination would probably be beyond him. In a personal interview with President B. F. Aylesworth, however, Schrader convinced him of his sincerity and ability to profit by the course, and he was admitted without examination.

The course lasted only nine months, but in that short time he not only learned much, but found that his chief interest lay in horticulture and nursery work. So when Professor Longyear told him of a summer job open at the new Bureau of Forestry nursery near Colorado Springs at \$35.00 per month, Schrader jumped at the chance. He saw himself, he later said, planting ten-foot trees with huge balls of earth around their roots.

At about this same time, S. B. Detwiler, now well known for his work in the Bureau of Entomology and S. C. S., was assigned to the nurseries, and on July 3, 1906, J. F. Kummel, the present Chief of Planting for Oregon, Washington, and California, came to Bear Creek. On the following day, July 4, Schrader organized himself into a one-man committee with the dual purpose of celebrating Independence Day and initiating Forest Agent Kummel into the camp brotherhood. The preparations and ceremonies were both simple. Early in the morning Schrader tied three sticks of dynamite together and detonated this "bomb" outside the headquarters building while Kummel was still in bed. But the fuse was a bit short and as Schrader ran from the scene with his body bent well forward, he was spattered with a barrage of gravel which cut through his overalls and around the area of his hip pockets. For several days thereafter, Kummel was courteously insistent that

Schrader "have a seat" whenever the Teamster entered the room. From the same source of information comes the statement that Schrader would invariably refuse, with the excuse that he did not "feel like sitting down just yet."

This episode is the last recorded display of boyish abandon. From then on, Schrader was so engrossed with the nursery work that there was no time left for such exhibitions of surplus energy. The history of Schrader became the history of the Monument Nursery.

During these early days experimental government nurseries were being operated at Bear Creek, Clyde, and Rosemont, as well as at Monument. Eventually, only the Monument Nursery survived. It was not the fault of the Forest Service employees that three of these nurseries failed, however. The nursery work was arduous, the pay was poor, and the hours were long. There was no "forty-hour week, with double time for Sundays and holidays," and the officials worked side by side with the ordinary "hands."

When the first seeding was completed and construction finished, the actual nursery work was carried on by a crew of only four men, who lived at the Bear Creek headquarters.

Breakfast was over and lunches packed shortly after daybreak. Then the nurserymen walked four miles over the Frosty Clemens trail to Rosemont. After taking care of the Rosemont beds, the workers walked eight miles west, up the Cripple Creek Stage Road to Clyde, where that nursery was weeded, cultivated and watered, after which the men made their way twelve weary miles back to Bear Creek.

There were many incidental and accidental causes contributing to the failure of the nursery work at Rosemont, Clyde, and Bear Creek, but an important elementary reason was the fact that the soil itself was non-productive, almost sterile. So a fitting epitaph for the dead

nurseries might be written in the testy words of Prof. J. W. Toumey, head of the Yale School of Forestry. "I wonder what fool picked this place for a nursery, the soil won't even grow weeds, let alone trees."

During 1908 and 1909 Walter Schrader came from the Monument Nursery to tend and observe the experimental beds at Bear Creek. Schrader would ride from Monument to Colorado Springs by trail, then walk **thirty one miles** to the seed beds!

On June 15, 1911, Schrader and Elizabeth Poley were married in Grace Episcopal Church at Colorado Springs. The bride was the daughter of Horace S. and Margaret Poley, formerly of Pennsylvania, but for many years residents of Colorado Springs, which was the birthplace of Elizabeth. She attended Colorado College for two years, majoring in Botany, and they were married the day the final examinations which concluded her sophomore year.

The Schraders started house-keeping at the Monument Nursery and there the three children were born; Walter Herman, Jr., July 14, 1912; Frank Poley, March 2, 1914; and Elizabeth Ferguson, September 15, 1915.

On December 31, 1943, Walter Herman Schrader retired from active Forest Service duty, after 38 years of service. He and Mrs. Schrader have a suburban home at the edge of the Garden of the Gods, known as "Vallecito" (Little Valley), between Manitou and Colorado Springs, with ground enough for a nursery.

Schrader has, among all men in the Forest Service, a rare, perhaps unique, privilege. He can stand on the slopes of Mt. Herman overlooking the Monument Nursery, and only a few miles from his present home, and see below him, not only the locale of his entire Forest Service life, but also the visible results of a long and honorable career.

R. G. COLWELL.

GROWING EVERGREENS FROM SEED AT THE MONUMENT NURSERY

In 1914, R. G. Colwell, Senior Clerk in the office of the Supervisor of the Pike National Forest, U. S. Forest Service, prepared from the Monument Nursery records a fascinating 200-page history of this great project. Excerpts from Mr. Colwell's biography of Walter Schrader, the director of the Nursery during most of its 38 years of operation appear earlier in this number. It was felt that the "high spots" of the developments in planting practices during these 38 years would be of interest and benefit to both professionals and amateurs. It is possible for even the neophyte to grow native evergreens from seed, and it is a very thrilling experience besides.

With the consent of the Forest Service, therefore, we present this brief summary of these chapters of Mr. Colwell's **History of the Monument Nursery**, entitled "Nursery Practices."

Twenty miles north of Colorado Springs and 54 miles south of Denver, near the town of Monument, a spectacular creation of nature is to be found. There a monolith of cream-colored sandstone, its base 25 feet by 100 feet, and its perpendicular sides 96 feet in height, towers above the flat land of the valley.

"It is the most prominent feature of the landscape, and is visible for many miles in every direction, so that it became known as 'The Monument' to the early-day trappers and traders. The Indians knew it, also, and their hunting and war parties camped at a nearby spring and left their 'sign' on its face in crudely carved symbols and pictographs.

"The site of the Monument Nursery is at the base of the Monument, itself, just inside the eastern boundary of the Pike National Forest, among the foothills of the Rampart Range and three miles west of the town and railroad station of Monument, Colorado. Mt. Herman rises abruptly to the west, and low parallel ridges with gently sloping valleys between them extend eastward toward Monument Creek."

There, in May 1907, Walter Schrader plowed the first furrow. Forty-two and a half pounds of seed were sowed and two years later 5,000 trees were distributed. In 1940, 6,239,000 seedlings and transplants were distributed, and an additional 4,263,000 were transplanted. During 37 years, 40,572,000 trees have been transplanted, and 36,000,000 more distributed. Truly, the growing of 76 million trees is "Big Business."

Like every other nursery, the one at Monument soon learned that good seed, good soil, and plenty of water were indispensable to successful production.

The best seed proved to be the nearest seed. At an early date, all but Colorado seed was, for the most part, eliminated. But even within this State, variations were found.

"It was noted in 1919 that tree seed collected on national forests in the southern part of Colorado and northern New Mexico had produced much larger and more thrifty seedlings than the seed obtained from northern forests. Specifically, blue spruce from the Santa Fe National Forest in New Mexico, Douglas-fir from the San Juan, and Ponderosa Pine from the San Isabel. But against this it was also observed that seedlings of southern origin were much more susceptible to frost injury, damping off, and other damage than the trees from northern seeds. Later experiments definitely proved that seedlings produced from seed grown near where they are to be planted were much hardier and the survival much greater than the seedlings from seed grown in other locations. Therefore, seed collected as near the nursery as possible has been accepted as preferable."

As to soil, it must have basic value to start with, and then be constantly cared for. The first three nurseries that were started by the Forest Service at Bear Creek, Clyde, and Rosemont, lacked good soil. Professor Toumey's statement that the soil of these nurseries "wouldn't even grow weeds, let alone trees," is quoted in



Monument Nursery—Photos by U. S. Forest Service



Mr. Colwell's biography of W. H. Schrader. The soil at Monument is a very sandy loam, which has proved satisfactory if properly cared for. The basic principles of preparation have not changed since the nursery was started in 1907; ample fertilization, thorough cultivation, and fallowing.

"The proper fallowing and fertilization of seed bed soil begins as soon as a crop of trees has been removed. The soil is plowed and then disked, pulverized, and floated until any lumps have been fairly well broken up. The field is then sown to peas, which are allowed to come to the blossoming stage. At this time a light covering of manure is applied with a spreader. If the growth of the soiling crop is heavy, the manure spreader should be followed with the disk. This chops up the vines and makes a more thorough job of plowing possible. The soil is again plowed and smoothed. It remains in this state until time for fall sowing, when it is again disked and leveled until the surface is smooth and mellow. Following the disking and floating operation, the seed beds are staked out after a standard plan. The beds are then lined out with binder twine held in place with oak 'hook stakes.' Sufficient hand work is then done to rid the surface of any stones, roots, etc., that might obstruct the proper operation of the seeder. This is followed by a hand float and then in turn by the marker. The beds are then ready for sowing."

Commercial fertilizers were tried, but "were found to be far inferior to barnyard and green manure." ("Green manure" is a legume crop plowed under while still growing). In the last few years, it was found that one-eighth ounce of ammonium sulphate per square foot, applied in solution to seedlings older than one year, "produced a very definite improvement in color and apparent vigor."

Ample water must, of course, be available. Flooding was tried, but found unsatisfactory. Overhead oscillating White sprinklers placed 18 inches above the ground have proved the best method of irrigation. "It gives even and economical watering and makes night watering satisfactory." The soil is kept moist to a depth of 10 inches, which is ascertained by simply

thrusting an ordinary surveyor's pin into the soil. It will "penetrate readily into soil of the proper moisture for nursery work, but it is difficult to force it into soil that is too dry."

Prior to 1935, seed beds were made 4 by 12 feet, with 2-foot paths between. Seed was sown in drills, running lengthwise with the beds. The drills were one-half inch deep and 3 inches apart, with a 6-inch space through the center of the bed. After the seed bed was prepared in the manner already stated, it was rolled with a concrete roller "which had been fitted with half-inch cleats, set at 3-inch intervals around the roller." These cleats formed the drills. "After sowing, the seeds were covered by drawing the fingers through the dirt between the rows." The beds were then rolled (without the cleats), treated with aluminum sulphate or sulphuric acid—as described later—and mulched or covered with burlap. This practice would be the one suitable for the average, small, private nursery. However, it was inadequate to cope with the production needed at Monument, and by the time Schrader retired in 1943, we find a "mechanized operation which employs a tractor and a 6-row multiple drill, followed by a roller and acid sprinkler on wheels. Two quotations tell the story:

"1907—42½ lbs. of seed were sown in 35 hours."

"1940—589½ lbs. sown in 8 or 10 hours."

"At present, the method followed under normal conditions is this: after the seedbeds have been brought to a smooth finely-textured surface, a 6-unit Planet, Jr. Multiple Drill is drawn the length of the block, which usually includes a number of 30-foot beds laid out end to end. Two trips are required to sow the series of beds, since it is only a 6-unit machine and there are twelve rolls drilled in each bed. The drill is followed by a heavy hand-drawn roller to firm the surface, then by the acid sprinkling cart, also hand-drawn. The final step is the placing of the burlap covering (for

spring-sown beds) or the application of winter mulch on fall-sown beds."

Very little cultivation is now done. In no other phase of nursery practice at Monument has there been a more complete reversal of ideas than in cultivation. The first seed beds were thoroughly and repeatedly cultivated by hand. But in 1916 the annually recurring shortage of funds "made economies necessary, and cultivation was omitted that year. There was no apparent difference in results." The same thing happened in 1918. Finally, in 1922, the practice of cultivating seed beds was discontinued.

"Experience has taught that as good results can be secured without cultivation. This is especially true if sufficient water is available to keep the soil in a moist condition. Experience shows that ordinary cultivation is detrimental to seedlings due to mechanical injury to the stems of the tender plants. Shade and numerous light waterings will keep the surface soil soft and prevent sun scald. This treatment, of course, favors the growth of the damping off fungus, and it is necessary to use aluminum sulphate to offset this tendency."

The careful preparation of the soil prior to planting, and the use of aluminum sulphate, has practically eliminated Monument's weed problem, notwithstanding the absence of regular cultivation. Care is "taken to destroy weeds before they seed in fence corners and other waste places, and weeding is done after a thorough watering which makes them easy to remove."

No problems caused Schrader more concern than those of damping off and root rot. It was finally ascertained that these could be controlled by the use of sulphuric acid and aluminum sulphate at the time of sowing—sulphuric acid for spring, and aluminum sulphate for fall.

"The present practice (1943) which seems from the reports to have become standard about 1935 or 1936, is as follows: For spring-sown beds, one-eighth ounce of commercial sulphuric acid per square foot of bed area is applied immediately after sowing, then burlap cov-

ering is put on to remain until germination commences. On fall-sown beds, a solution of aluminum sulphate is applied at the rate of one-fourth ounce to one ounce per square foot, depending on species and soil condition, then the regular winter mulch is put in place."

(Schrader repeatedly called attention to the fact that this continued use of aluminum sulphate might eventually injure the soil. Mr. Jay Higgins, in charge of nursery and planting for the Rocky Mountain Region, states that chemical tests made in 1945 disclosed one area where this has occurred. Ed.)

Mulching has likewise been a problem that has caused much experimentation at Monument. Various media and many practices were tried. The present routine is as follows:

"Spring sown beds were . . . covered with burlap. Protection frames were put in place to keep out seed-eating rodents . . . The burlap was removed as soon as the seedlings began to break through the soil. The pine needle mulch on the fall sown beds was removed in the Spring as soon as germination started, but before the seedlings appeared above the surface, and protection frames put in place. All spruce and fir seed beds were completely protected with partially rotted pine needles. This mulch was placed directly on first year seedlings. The mulch was supported over second and third year seedlings on planks and slatting to prevent winter moulding, which usually attacks these heavier topped seedlings if the mulch is allowed to weight them down. These mulched beds were watered sufficiently to permit the mulch to form a board-like covering and maintain a higher relative humidity in the surrounding air. Pine and cedar seedlings of all ages were covered with protection frames as far as possible."

All seed beds are shaded with lath slatting throughout the first year. With older trees the practice varies with the species, and has not become standardized, besides. Originally, the lath was placed several feet above the trees, but the practice has now been uniform for many years to use "low shade." The old system "of removing shade during protracted cloudy or damp and cold weather was abandoned

in 1915. It is now left on for the season regardless of temporary changes in weather."

Many different theories relative to root pruning have been advanced, from time to time, at Monument. One thing is certain, and that is that beds that have been root pruned require a great deal more water. Schrader felt that root pruning — at least with one-year pine and two-year spruce and Douglas-fir — produced a better root system and a more vigorous tree and that this should be done "whenever moisture conditions will permit." However, except as to two-year-old Douglas-fir that are to be held over for a third year, "the procedure is still in the process of development."

Seedlings are generally transplanted at the end of the second year, going to the planting areas as 2-1 transplants.

Transplant trees receive the same preparation as the seed beds do, and the transplanted trees are cared for in the same manner as are the seedlings.

"A very moist, almost wet, soil is demanded for the best job of digging transplants because such a condition is necessary to permit removing the plants without damaging the fine roots and root hairs. That same moisture, however, results in leaving the soil cold and sour — unfit for immediate planting. Furthermore, at least a year of rest between tree crops is necessary for restoring the fertility of the soil."

The beds are therefore fertilized and sown to peas for a year.

Next to damping off and root rot, the most difficult pest to combat has been the rodents. In an early longhand record, it was stated that "Rodents caused considerable loss and damage by entering the beds under the snow and girdling the trees"; from which an early typist reported that the rodents caused the loss and damage by "entering the sod and grinding their teeth." If the mice didn't grind their teeth," Schrader did. Finally it was decided to enclose beds with a fence of hardware cloth with

three meshes to the inch. This was the answer to the problem.

"Since 1923 winter rodent loss has been a minor hazard at Monument nursery, though in 1935 one well protected bed was almost entirely destroyed by field mice. Thorough examination by members of the nursery staff failed to find any opening by which the rodents could have entered the bed. For several days the affair was an annoying mystery until a CCC enrollee solved the case with a very simple explanation: In the course of their work at the nursery, some enrollees had uncovered a nest of field mice, and with misguided humanitarian motives had placed the entire family of mice inside the 'rodent-proof' bed. Full fed, and protected against all enemies, the mice had lived very comfortably through the winter."

These are the procedures that have enabled the Monument nursery to grow almost eighty million trees and to distribute over six million sturdy trees in a single year. The achievement is one of which the Forest service—and particularly Walter H. Schrader—can be very proud.

OUR MEMBERSHIP YEAR

There has been some uncertainty among our members who have paid their dollar at odd times as to when their membership terminates. Subscriptions to most magazines run for one year from the time of the first issue sent. There are no subscriptions sold to The Green Thumb. It is a bulletin sent only to the membership of the Colorado Forestry and Horticulture Assn., and dues in this organization are for the calendar year.

So at whatever time your money is received your membership is either for the current year or for the small balance of this year and all of next. This is to simplify bookkeeping and be able to put more of the income into actual expense of publication. If you are notified that your membership has expired before a year has gone by you probably paid up early in the year and missed a couple of months.

THE COLORADO RIVER REDBUD "PUZZLER"

In a recent issue of the Green Thumb (vol. 2, pp. 16-18, 1945), Charles Kelly gave us a very interesting account of the occurrence of the Redbud tree along the Colorado River above Lee's Ferry. The editor's note heading this same article asks: "How many Green Thumb readers know of similar instances of plants found naturalized far from their natural range?" In this particular instance, the Redbud in question is neither naturalized nor far from its natural range, but native and quite at home; it is *Cercis occidentalis*, known from various places in Utah, Nevada, Arizona, Texas and California, being particularly common in the latter State.

Although the differentiation of species in the genus *Cercis* is at times a little difficult, a comparison of the materials—either living or by means of herbarium specimens—does indicate that a series of rather well-defined species does exist. As a group, however, they have much in common; there is rarely any mistake, for if you know one species of Redbud there will be little, if any, trouble in identifying any of the others as a Redbud, no matter where you find them, so similar do they appear.

It is therefore very likely that anyone knowing the Redbud of the Eastern U. S. (*Cercis canadensis*)—and not aware that there also is a native Western species—would be startled at finding a Redbud rather common along the Colorado River; probably almost as much as they would be should they chance upon the different native Redbuds while travelling in Mexico, southern Spain, eastward to the Persian hills, in Afghanistan, or on seeing the various (and horticulturally important) species wild in the mountains of China. As Charles Kelly pointed out, the present distribution of our native western U. S. Redbud is somewhat "spotty."

This, very likely, is because in much of its present range it appears to be a relic, a remnant from a time when the climate of the region was moister and the species more wide-spread and probably much more common than at present; also, while not obligate, it does tend to favor sites which have a slight excess of calcium (at least that is one of the major limiting factors in the distribution of the species of the Eastern U. S.).

The real "puzzler" is in attempting to explain how so similar-appearing a group of plants originally got so wide a distribution. Plant fossils indicate that it is a fairly old group; probably the Redbuds got scattered about in those ancient times before the continents of Europe, Asia and North America became separated, when they were a single mass, a continent called "Holartica" by the geologists. But, for the present, we will let the "fossil" botanists worry over how and when the Redbuds got so widely dispersed in what is now the northern hemisphere; it is sufficient for those of us who work with living plants to know that they are.

H. L. CAMP

New York Botanical Garden.

BRIEF HISTORY OF WORLD WAR II

John Stockbridge

We all raised vegetables
Right from seeds,
And got some food
And a great many weeds.

We worked on gardens
Days and nights,
And we developed
Strange new blights.

We won two wars
With our gardens new,
(But the army and navy
Deserve credit, too.)

THE EXPERTS SAY:

Keep your compost heap in the best possible condition this winter. It is one of your most valuable garden properties. When you screen it to get the fine stuff for your lawn next September, try using the coarse stuff you screen out to mound up over the roses, later, for winter protection.

GEORGE BEACH, Assistant Horticulturist
Colorado A. & M. College.

Buffalo grass makes a good lawn. The seed is expensive, but it is well worth the cost. Sow in the spring. By fall small clumps, two inches apart, will be showing up. These will send out runners in all directions and the turf will thicken up. After several years you will have a solid mat. The grass will choke out all weeds. No mowing required.

MAUD REED, Biology teacher, Boulder High School.

If you are allergic to work as I am, why not plant your tulip bulbs twelve inches deep, to the top of the bulb, and then watch them bloom for ten years without any digging?

ROBERT E. EWALT, Garden enthusiast, Denver, Colorado.

From inquiries coming my way, I anticipate a post-war revival of interest in rock gardens, I hope of the right sort. I usually ask if ROCK garden or rock GARDEN is meant. If I detect an undue interest in "pretty rocks" (museum specimens) I change the subject. Those discords with Nature—ROCK gardens—resemble JAZZ on the radio, in that both are thrust on one's unwilling attention in a disproportionate frequency. Both illustrate sublimated ignorance of certain fundamentals of Nature. (the physics of sound and the physiology of plants). I put on an extra burst of speed to get by one and tune out the other, too often encountering another atrocity at the next corner or another cacophony on the other networks.

LESLIE F. PAULL, Horticultural authority, Petersburg, Colo.

Squaw apple is a beautiful shrub, native in various places on the Western Slope of Colorado. It has early apple blossoms, with a spicy fragrance, followed by attractive red and yellow apples, quite decorative. But don't try to eat them, you will never forget that taste. Oh, yes, the botanical name is *Peraphyllum ramosissimum*, and there is a picture of it in Longyear's "Trees and Shrubs."

M. WALTER PESMAN, Landscape Architect, Denver, Colo.

If you didn't give deep irrigation in mid-December to your Schwedler Maples, Birch, Oaks and other semi-delicate trees of last spring's planting, don't blame your source of supply for a freeze back or possible entire winter-kill on these and similar items, when the damage shows up next spring.

SCOTT WILMORE, W. W. Wilmore Nurseries, Wheatridge, Colo.

I would like to see someone plant a group of birches, a few native ones on the outside and then masses of redbud. I planted many years ago in the Denver Parks specimens of *Sophora japonica*, *Ginkgo biloba*, *Koelreuteria paniculata*, and Redbud, and many of them are still doing well.

ERNEST GUTHIEL, Horticulturist, Littleton, Colo.

A transplanting stunt that I have not seen practiced was mentioned in "House Beautiful," and I pass it on for what it is worth. It was to discard the soil from the excavation that is to receive the tree or bush, and replace it with previously collected top soil. First, put six inches of top soil below where the roots will rest.

R. D. THOMPSON, Head Gardener, Littleton, Colo.

FOUNDATION PLANTINGS

A careful consideration of "Plant Materials" used in foundation plantings will ultimately repay such an effort. It appears that too many in selecting plant materials for such a use fail to take into consideration that plants "will grow" and a final appearance differs greatly from the immediate effect obtained at the time of planting.

This can be overcome if one learns about the ultimate habit and growth of the plants. In general, it is safe to use plants that will conform to the lines of the house and a given space. Avoid using plants that become so large as to dwarf the structure, thereby throwing the entire picture out of key.

ANDREW LARSON, Landscape Architect, Denver, Colo.

The need for tree surgery is practically always evidence of poor judgement in the choice of species, form, and care of trees. It can be avoided.

J. V. K. WAGAR, Professor of Forest Recreation and
Game Management
Colorado A. & M. College, Fort Collins.



WINTER GARDENS

Form in a garden shows throughout the year. It is embellished by new foliage growth and the color of flowers in the spring and summer, but a garden must also be beautiful in winter.

Evergreens, which give form and color the year around, and catch the snow in winter, are perhaps most important to a winter garden. Yellow willow and red dogwood twigs, and the downy blue and black and red buds of the blue bark willow are only a few of the

other colors which make a winter garden. The snowdrops add their note, blooming through the February snows.

A slope, a low wall or rock terrace, a trim line of hedge, a fountain, pool or seat, even a path or a line of stepping stones—all give the garden a design which shows in even the driest part of winter.

S. R. DeBOER.

Landscape Architect.
Denver, Colo.

HORTICULTURAL HOLIDAY

The Christmas that I've always known

Is not the same this year

The old familiar phrases

Just will not do, I fear.

This going horticultural

Upsets my life, I find

I cannot think the old thoughts

With Bailey on my mind.

The Yuletide is "pulchella"

The candles "fulgens" and bright

Is the tree a "lasiocarpa"

"Columnare" in its height.

The boughs are "atrovirens"

With "coccinea" berries hung

"Speciosus" are the trimmings

So "profusus" are they strung.

The turkey "delicious"

And "delicatus" too

Will sustain my bewildered spirit

And once more my strength renew.

I'd like to be "procumbens"

And relax my "rugosa" brow,

My hair is turning "glauca"

And my tired head "nutans" now.

But the thought of a new word
intrigues me

"Rediviva" I become

I puzzle anew over species

And again my Bailey I thumb.

I cannot take it or leave it

'Tis a chronic affliction I know

I'll study till I am "senilis"

And "subdeantus" I grow.

—Katherine Eames.





~~~~~ THE GREEN THUMB ~~~~~

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"To preserve the natural beauty of Colorado; to protect the forests; to encourage proper maintenance and additional planting of trees, shrubs and gardens; to make available correct information regarding forestry, horticultural practices and plants best suited to the climate; and to coordinate the knowledge and experience of foresters, horticulturists and gardeners for their mutual benefit."

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VOL. III

NO. 2

Through the courtesy of The Colorado Museum Association

THE HOME GARDEN CLUB

extends to

THE COLORADO FORESTRY AND HORTICULTURE ASSOCIATION

a cordial invitation to an evening meeting in
Phipps Auditorium, March 22, 1946, at eight o'clock

Violette McCarthy accompanied by Kathleen Joy
will present a group of Nature Songs.

The featured film will be the latest one by

Mr. E. R. Kalmbach of The U. S. Fish and Wild Life Service,

"THE BIRDS, THE BEASTS AND THE RAINBOW"

on the screen for the first time.

Two additional films from the U. S. Forest Service,

"FORESTS FOREVER" and "OCALLA" will be shown.

CALLING ALL TREE LOVERS

There will be an opportunity April 28 for all good foresters and conservationists to practice what they preach by helping plant small forest trees. This will be in cooperation with the Colorado Mountain Club and the U. S. Forest Service, and will probably be at the Nederland-Rollinsville burn. Reserve this date. Call the Mountain club office (TA. 0677) and register about a week in advance, so that necessary arrangements can be made for tools and trees. Bring a picnic lunch. There will be a short botany trip at noon.



DECIDUOUS TREES FOR COLORADO PLANT ZONES 1 & 6

Grand Junction, Montrose, Delta

Most of zone 1 (Grand Valley) is about 1000 feet lower than Denver and has an average of two weeks longer season at each end. This makes it possible to successfully raise many things that are considered as borderline in zones 4 and 5. The usual alkaline condition of the soil, lack of proper drainage in places and lack of moisture restricts the list however so that probably no greater total of trees can be grown here.

As we go up the valleys to any considerable altitude we have a correspondingly shorter season which cuts out some borderline trees again. There will be found many small valleys quite high, which, because of their added protection, additional moisture and better drainage will be favorable for almost all the trees commonly grown in the lower, larger valleys.

We list below some exceptions from our complete list for zones 4 & 5 which was published in the July-August issue and amended in the following issue.

The Western Slope has always been famous for its fruit; apples, cherries, plums, pears and especially peaches. The flowering forms of these fruits also may be grown here.

Some hardy types of English Walnuts have occasionally survived. Hard-shell almonds and hard-shell pecans are occasionally found.

Some trees from list "B" which might be moved up to list "A".

Acer negundo, BOXELDER.

Acer saccharum, SUGAR MAPLE.

Acer platanoides, NORWAY MAPLE.

Catalpa speciosa, WESTERN CATALPA.

Morus alba tatarica, RUSSIAN MULBERRY.

Platanus occidentalis, SYCAMORE.

Populus balsamifera, BALSAM POPLAR.

Prunus serotina, BLACK CHERRY.

Ulmus glabra, SCOTCH ELM.

Most of the Class "D" (Small Trees) could be moved up to class "C" for this area.

We solicit remarks from any reader who knows of additional trees growing in these zones, or who has any other corrections.

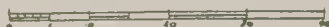
The accompanying pictures were supplied through the courtesy of Mr. J. G. Curtiss of Paonia. They show some of the unusually large native oaks and aspen found on the Western Slope, and a beautiful scene in the wild country of Gunnison County.



Large Native Oak on Western Slope

DENVER MAY, 1943
SCALE ONE INCH EQUALS
EIGHT FEET

M WALTER PERMAN
LANDSCAPE ARCHITECT



IT'S the old, old story of the leaky roof that was not repaired,—this garden plan. You don't need a plan for the garden when you

can't do any planting anyway,—and at the proper time for planting trees, shrubs and flowers there is not time to make a plan. What to

do? Right now we should give ourselves that extra push!

. Difficult? Not at all!

Buy yourself a tapeline, 50 feet or 100 feet long; it will cost as little as taking your wife to a movie: \$1.35 will buy a 100 foot cloth tape-line. Then start measuring: everything in your yard, the location of the house and garage, fences, existing trees and shrubs, even the strawberry patch. Get the distances from the outside fences or from the house, measuring at right angles.

To make a map of the place it is handiest to have every inch on paper represent eight feet on the ground. The average 50 foot lot will require a piece of paper about 12 by 24 inches. Four feet to the inch makes a more unwieldy map, except for a very small yard.

Now, before we are ready to make a garden out of that map, we should make a list of the things we want in our garden. We will probably need a clothesline, perhaps a playground with swing and bars, probably a fruit tree or two, a place to sit, maybe a birdbath, pool, or rock garden. It is also well to decide what sort of trees and shrubs are our favorites. We should have what we want, not what someone else wants us to buy.

Now the job of planning the yard consists of locating these "wanted" things and plants in such a way as to screen out unpleasant views and to feature, or frame, pleasant views. It is well to indicate on the plan just where those two types of views are, and seen from which places.

Good screening material is Lilac, Honeysuckle shrub, Ninebark, various Viburnum species, Mock-orange, Caragana, Ligustrum, and for evergreen effect, Rocky Mountain Juniper and other junipers or

even spruce, as indicated* in the last number of the Green Thumb.

For close-in effect it is best to use fine-textured plant material, such as spireas, Jap barberry, (and its varieties), low ninebark and low caragana, Alpine currant, beauty-bush, Flowering Almond.

In general the "open-lawn-effect" is good; in other words we should not clutter up the lawn with a lot of fussy flower beds, unnecessary shrubs or trees, or garden furniture. There is great charm in an unbroken piece of lawn, bordered by flowers or shrubs.

All this has been said before, again and again,—but not always heeded. Now, in finishing up, let us see how garden planning in Colorado is different,—not in principle but in applying good design.

First of all: we should take advantage of our climate and create a garden that is good to live in for at least three hundred days a year. We should feature sunshine in winter and shade in mid-summer.

In this let your dog be your landscape architect; he will intuitively find the nice protected spots in winter and cool retreats in July or August. After he has shown us these spots we can improve on them, by placing plant material or arbors, pergolas or what-not around them. Then in order not to be quite dog-dominated, why not use a little judgment in providing bright spring color and gorgeous fall effects. We can grow first-class tulips, peonies, springflowering shrubs, and for fall we have sumachs, Ginnala Maple, Winged Euonymus and its relatives, dwarf ninebark, native roses.

Colorado gardens should feature Colorado material and plants that look happy and colorful here, not sickly shrubs that mourn for other climates. We can build Colorado gardens superior to any.

HORTICULTURE OF THE WESTERN SLOPE

By MARY B. PLAISTED

Mrs. Neal Plaisted has lived on the Western Slope since 1904; most of this time on a farm. She has always had a garden of some size, and travels all over her part of the state with her husband who is one of the firm of the Mile High Seed Company. She has acquired her horticultural knowledge mainly "from the handle of a shovel or hoe". She gives us here a rather complete picture of horticulture on the Western Slope of Colorado.—Editor.

What do we plant when we plant the tree?
A thousand things that we daily see.
We plant the spire that out-towers the crag.
We plant the staff for our country's flag.
We plant the shade from the hot sun free.
We plant all these when we plant the tree.

—Henry Abbey.

AYE, and fruits, flowers and freedom, beauty and wealth. The very life of the land itself depends on trees, and nowhere so surely as on this steep west slope of the continental divide—Forests to attract and to hold rainfall and snow; orchards and wood lots and wind-breaks which help control erosion. The practice of planting wood lots and wind-breaks is not as well followed here as in the states farther east, but there is, and ever will be, pasture and wasteland which can be induced to grow woodlots and windbreaks to great advantage.

ORNAMENTAL TREES

One cannot even THINK trees without first thinking of the wonderful old cottonwood trees lining the river beds and every wash, and transplanted to surround older farmsteads. Often reaching sixty feet in height and with enormous limb-spread, they provide safe shade for farmsteads while living, and when dead, great quantities of wood, or even lumber. They are an artist's dream at any time of the year, sharp angled, gray trunks and warped branches arching above farmsteads in winter, greening with spring, to stand with dripping scarlet tassels, then tender green leaves, rounding to summer's heavy foliage, ripening to rich gold in autumn, completing the cycle in angular arches above the snows of winter. To we who were here when these first ones stood alone above

the yellow soil, no more formal planting can take their place.

Then we have Carolina poplars, Lombardies, balm trees, tamarix, Russian olive, American and Chinese elm, weeping and golden willow, a few black locust and ash, black and English walnuts, Catalpa, Ailanthus, red maple, white oak, weeping birch, hackberry, Caragana, many kinds of conifers and evergreens and one planting of Magnolias.

There are many other shade and ornamental trees. One in particular, I remember, a symmetrical mountain ash growing on the north edge of a north facing site and shaded most of the day. Its year long beautiful lacy foliage and thick clusters of bright red berries distinguish it readily. A short row of graceful sycamores grow between paved street and cement sidewalk, and another arches gracefully above a south facing lawn. Sycamores are quite as lovely naked under a steely sky as leafed out under an August moon. Behind the cottage where the single sycamore lives is one slender Norway maple as beautiful as the sycamore. In the narrow space between the houses a flowering crab decided not to stay low and ornamental and stretches skyward above the eaves, its fragrant pink bloom far above the reach of the gardener's shears.

Weeping mulberry on the golf links and on the campus of Mesa college are interesting trees attracting both robins and the writer when their luscious fruits ripen. In several places over the slope, the Blodgett home ranch in particular, mile long windbreaks of Russian

mulberry arch above the grassy meadows where the ewes lamb. We have been there when tons of purple fruits lay piled ankle deep fermenting in the summer sun. Mulberries grow readily here. Their rich purple fruits are splendid "pie fodder" and make fine sauce. Tedious to pick and stem, one can shake ripe ones down on clean canvas and wash in a sieve under water force. Cold packed they retain all of their richness. They cannot be recommended for the city lot as they use lots of space, and should they bear heavily, attract flies as well as birds. One slender seedling grows in our wild hedge, and robins and flickers get as much pleasure from its sweet white berries as I do.

Beyond the Holland wash on the highway grows one white oak, the only one I know grown here from an acorn. Standing forty foot tall, any student of trees can tell at seeing distance it is a "furriner". Jack or scrub oak grows here at a certain height on the mountain. The rich, dark earth in the oak groves, acidulated by centuries of fallen leaves, is in demand to neutralize the alkali found in the soil of the valley proper. Their foliage turns a rich bronze in autumn, and the hillsides below the bright yellow line of the aspens are royal colored indeed.

I know of one English walnut growing on the south side of a wall, a well shaped tree. Its scant harvest promises more when it is older. Almonds were grown in the Surface creek orchard area many years ago. I cannot find the old trees now, nor any one knowing of them. I remember them well because when we first came into the orchard country from the barren plains states we "cooned" apronsful of the almonds thinking them like the wrinkled wooly peaches which once in a while developed on the scraggy trees which the wind of the plains left standing in our doorway.

Among the faster growing deci-

duous trees, Balm o' Gilead, symmetrical and fragrant wave their brittle branches over many a farmstead, their owners rating them poplars or cottonwood, but their rich, sweet fragrance in the hot sun or after a shower betrays their true identity to the initiated, and spring rains loose nostalgic fragrance to me.

A pair of scarlet maples on a north frontage grow lustily to compose a spot of beauty across the street from the campus. Next door silver maples spread their mottled branches high. They grow easily here, their soft, cottony green turning to gold early in autumn. Like so many trees they are more beautiful leafless than covered.

On the California Mesa one cannot but appreciate the silver poplars about the farmsteads. With plenty of space and water they make a sturdy growth. Unless one disturbs their roots they do very well in their appointed place, but should one plow or spade near them, immediately there springs up a veritable witches' thicket of water sprouts. Here a row of Russian olive borders an east and west road. They are lovely now in the heat of summer, but will catch and hold the snow and spoil as much road as they line. Here are two great blocks of very old apple trees, gnarled remnants of the many acres which once grew here. Cold springs, high priced land and low priced apples decided in favor of diversified farming.

At the hotel are junipers. The slender spired type form a screen between the service yard and the formal planting of thickly set box elder and Russian olive.

Beyond Montrose are a few small blocks of the old orchards. They are close onto six thousand feet elevation there. Trees make and keep a better growth, and the soil is gravelly with better drainage than that of the Grand valley. There is more of both snow and rainfall and

cooler summers, consequently there are many more evergreen trees. Especially do those which are native at a slightly higher elevation do well there.

Lilac and mock orange grow into trees here. They too love cooler weather. Back in the main valley for miles and miles along the Colorado river and up all the side creeks and washes the tamarix grows in tangled groves. This plummy wanderling grows as profusely as do the red willows on any canal bank, a bower of peppery pink beauty before their slender branches green. Planted away from the water they will grow, but oddly will bloom most of the summer, some branches bursting into bloom after each shower or good soaking with hose or bucket. At Meeker and other places of higher elevation and cooler, moister weather they bloom a deep rose. Strangely, I can remember when there were few tamarix along our streams, but no one seems to know when they came in and from where.

The Russian olive brought into this area as an ornamental has naturalized splendidly, spreading into pasture and fence row as well as being used in planned plantings. Their small, decidedly astringent fruits with the characteristic oval pit of the olive are a principal part of the winter diet of flicker and robin. Any sunny February day finds the shining bronze branches gemmed with turquoise as flocks of northern bluebirds feast on their bounty. Gray-green and very graceful they lend themselves well to hedge row and fence as well as to more formal plantings. Fast growing and decidedly hardy they have no known enemies. They are not recommended for planting close by the house as they really are a dirty tree shedding twigs, leaves and berries. Heavily fruited branches, cut when the rich, faintly pink bloom is on the fruits, and the

leaves still cling are as pretty a winter bouquet as the graceful sprays of the pepper trees used so much down yonder.

I do not know why more maples are not used here for the few specimens I know are hardy and certainly graceful. We demand very fast growth here. Our position somewhat corresponds to the west side of the sloping roof under the hot afternoon sun, and the yellow range running crosswise to the north reflects back the afternoon sun rays nicely. When the canals were built across the yellow land of the lower valley someone at each camp planted rows of Lombardy poplars, and one can still see their slender spires marking reaches of canal as picturesquely as they do in France and Belgium. It is a dirty tree, self-pruning, always shedding twigs and carrying dead branches. Their tall tops attract the lightning, still, they throw a long shade, and planted close are a splendid wind-break. They, too, are fragrant after the rare showers. Remember to look up through one at the far distant sky, standing close by the huge trunk.

Bolleana poplars with their silver leaves and white boles are rapidly taking the place of the old Lombardy. Several planted in a natural cluster in the corner of the lot farthest from your picture window soon grow into a dominating feature of the landscape. Since their scanty branches cling closely to the trunk, birds love them, and even in the city, the wild birds will brood in their hard-to-climb heights. Placed beside the drive or across the back of the lot they make their own place in the sky-line landscape. They are hardy to city conditions, and like all the poplars, spring up in clusters of suckers if their roots are disturbed.

American elms are used here but are subject to scale and blight. They are a lovely tree, spreading

their black branches against the gold of a winter's sunset. The Chinese elm proves much more tractable as a shade tree. They are fast growing, throw a quick shade, and scale and blight resistant, their feathery branches wave in the breeze from farmstead and city lot alike. They seed almost to nuisance. Planted closely and clipped they make a sturdy hedge.

Weeping willows love the canal banks, and were chosen for the Memorial plantings beside our highways. They make an enormous, graceful and dirty tree for they constantly shed branches and leaves. Spring days when all the upper valley is a rosy mist of peach bloom the many tall old willows add their accent of soft green. I love the golden willow, lovely all the year, but they are particularly lovely in winter when their branches show the real gold. Cutting out their tops at certain height causes very thick growth and they look like tumbled feather dusters. Golden willows grow along with elm, mulberry, olive and locust in my wild hedge.

Black locusts are used much here for shade trees. Growing rather more quickly with irrigation than on the plains they are much inclined to grow from any disturbed roots. The few ash growing here are so very lovely in autumn that we drive out of our way to see them. Since frost holds off here often until late September and then comes hard and keeps on, often only a few days will see the ash trees bare of their bright gold.

Someone says there is one tulip poplar growing here. I saw a cork or pith elm long ago but cannot find any trace of it now. Box elder, native of the higher slopes, is used in rougher plantings. It is a dirty tree, its sweet sap attracts flies, and its habitant bugs with their bright red waistcoats are decidedly a pest. Catalpa do well here. If crowded

they will grow tall, but are a nice shaped, rounded shade tree if given plenty of space. They have always seemed fragile to me, perhaps because of their bloom. The sleek brown beans, dried and enamelled bright colors add a distinct note to the "charm string" of gourds for chimney breast or verandah angle. The ailanthus has a very definite place in our landscape. Hardy and immune to alkali soil it will grow almost anywhere. Placed before a window or over a verandah it will throw a dense and pungent shade in summer, and is only a bundle of graceful sticks in winter.

In the warmth of the reflected rays of the sun beneath the towering Palisades a planting of solanageana Magnolias are thriving, their rich, waxy green foliage seeming tropical against our winter landscape. I know of two fine weeping birch as daintily graceful as a piece of silver filigree. The fine black twigs hang veil-like over the silver trunks and branches.

Native quaking aspen have the same green-silver bark. They are set in the planting on the sloping hillside above the lagoon where the wild ducks nest. their silver branches shining among the dark green conifers.

I believe we have samples of all of the hardy conifers and evergreens here. Some are subject to the red spider and must be sprayed. Several transplanted natives, set long ago, are towering trees now. Several have been used as municipal Christmas trees. One must protect the more tender evergreen from the bright sun when there is snow for they burn quite readily until they are established.

FRUIT TREES

From the left-over blocks of apple and pear trees to the newest planting of peach trees in the rich red soil of some sunny slope our orchards do well, and have contributed several millions of dollars

yearly to the income of the Western Slope. The older peach orchards were set to the Elbertas and Hales, now we have several newer varieties: Hale-Haven, Golden Jubilee, Carmen (a white peach and better for eating than for canning as its delicate flavor does not bear holding long. I will not can them at all unless I can pick them from the trees and can within an hour). The clings and the Salways lengthen out the harvest season. The true home orchard should have one tree of several varieties so that the season of fresh fruit can be lengthened. Almonds have been grown here but to no commercial extent.

Cherries, sweet and semi-sweet, with many of the bright red and dark pie cherries are grown and canned or fresh frozen: Richmond, Montmorency, Morello, Royal Dukes and Royal Annes, Byngs and Oxheart. The sweet cherry trees are set like punctuation marks about the blocks of peach trees. The sour cherries usually grow in blocks or long rows between the more used peaches.

Remnants of the old pear acreages line roadside and orchard end. Very few wholly pear orchards remain. There are Bartletts, D'Anjou, Lawrence, Nellis, Russet, Seckle and Keiffer, to name a few. Bartletts and Lawrence prove best for the home canner, with the small Russet as a later one. Keiffers are fine 'way next year if one has hidden their golden stoniness in bin or barrel, well wrapped, and in a dark cool place. D'Anjou is a lovely round white pear but has not the fine flavor of the golden skinned ones for me.

There are plums and prunes in many varieties, but never in such quantities as the peaches. Of the many varieties of apricots, two types are best for the home garden, and as they naturalize well, some seedling in the stone fence or growing beside the barn may have as

fine a flavored and colored fruit as the best tended budded trees. The small red cheeked ones with plum shaped pits and distinctive tart flavor are fine if they are allowed to ripen on the trees. We have best results with the larger commercial type for here in the edge of the city one's fruits and their time of picking are determined as much by the activities of the neighborhood children as by the weather or the calendar. I have picked the large flat-sided 'cots when they were green enough that they did not like to come off the tree, and canned them in rich syrup by cold pack method and had a delicious product. The smaller red cheeked ones are lovely for anyone making butter and jam. All are much better if one can let them ripen on the tree.

Our apples range from the old favorites: Ben Davis, Gano, York Imperial, Winesaps, Jonathan Pearmain, Grimes Golden and Rome beauties to the newer Delicious and Jonathans. Jonathans are one of my special favorites for pie fodder, eaten fresh or baked or sliced thin and canned with syrup of their own boiled skins. Romes are good bakers and fine fresh apples. Both yellow apples are fine fresh. Bens are good sometime the next summer if they are stored properly. Wolf Rivers are a knotty, wobble-jawed variety. With green and red striped skins almost always cracked deeply at the stem end, they make the most delicious "cooked-up", that is, strained apple sauce. Yorks are wobble-jawed too, flat, hard, not mellow but juicy like a Jonathan and good bakers and good keepers. Bens have a delicious flavor, and their white flesh makes them a fine apple for either family or commercial drying. (Mother strung them on white cord and dried above the fire and in the attic when we were very young."). Siberian crabs are my favorite of

the crab-apples with their soft pink cheeks and clear yellow skins. I know an orchard where a dozen old Siberian crab trees blossom beautifully in late May and where the ground beneath in September is ankle deep with lovely, wormy apples. I left many tall jars of crab preserves and sweet pickles in the dark cellar under that old stone house. The larger crabs never hold their shape used whole but have lovelier color for jell. All make delicious spicy butter.

Grapes and many varieties of berries do well here, blue and white Concord, Agawam, Catawba and some of the finer sweet grapes.

FARM CROPS

This district, (not all of it lying within the boundaries of the state but including the closer eastern parts of Utah), was rated third in production of areas similar in size in the nation during the recent war. Our soil and irrigation problems are peculiar to our district, lying as it does on the steep slope of the divide. Much of it lies in natural sheltered valleys but still more on the comparatively level mesas, and not all of it lies under irrigation. There is still much land here which would respond to irrigation if we had sufficient water, but my personal idea of our agricultural economy is not that we develop still more areas but that we develop better the areas now in cultivation. Dairying with its attendant pasture and haying programs, with much of the richness taken from the soil going back on to it in the form of barnyard manure, would come nearer solving our problem. More and better hay crops (which are proving possible with our newer type of insect controls), more and better pastures fitted into the regular crop routine conserve the soil which is so rapidly washing away down our steep slopes. Dairying and poultry rais-

ing fit in nicely with most, if not all, farming practices, and I can say from experience, are often the backbone which hold the farm's economy upright. Row crops: beans, corn, potatoes and sugar beets, are necessary also. The canny farmer will not put all of his eggs in one basket. Contour rows are beginning to be seen in our steep fields. Again, the pasture and hay crop plan will permit of more contouring, with resultant conservation of soil, its fertility and moisture. I have fairly wrung my hands in despair at steep fields which are creased to irrigate with the slope instead of across it.

Besides beans, we have contributed our long share of potatoes to the diet of the world. Sugar beets have long been an accepted part of good farming rotation. We do not grow enough of any of the small grains nor of corn, but now with better seed we are gradually changing that. And speaking of seed, this Inland Empire is rapidly taking its place as one of the better seed producing areas of the Nation. Small plantings of seed, which is distinctly a cash crop, fit in nicely with other better farm practices. Individual farmers should never stake their whole plan on seed alone but leave that to the large commercial grower as it is too great a gamble, and most of the small seeds are row crops which do not fit in with soil conservation.

Truck gardening and plantings for the several commercial canneries have always added to our farm income here, and never more than in the last four war years. With four or five canneries and several fresh frozen plants running full capacity from early July until up into December one can see how great a part this industry plays in the district's economy as a whole. Farming is a full time job here. One cannot set the water and leave for a visit with wife's folks. Weeds

follow the water and must be fought. Again, our newer controls, both chemical and manual, will prove of great aid. In the first classification, the new hormones as well as chemical sprays are proving satisfactory. Better cultivating methods and weed burners will be of great help. Our area has suffered as much, or perhaps more, from the shortage of labor as any other like area in the States. Weeds follow the canals and ditches, and when fields are left idle for several years the weeds take over like second growth in a timber slashing. A farmer with only half, or less, his usual help cannot both harvest crops and

practice clean cultivation. In consequence, both production and program of good farming suffer.

We do not have as many farm owners here as we should. Some, from farming districts where different farm methods are practised, find our methods hard to learn. Our soil is tough in areas and requires special treatment, but a little study and a great deal of application turn any of it into wonderful productivity. We have weeks longer growing season than many other places where folks are farming successfully, and we have the finest climate of any section of the whole Nation, take it year in and year out.

A "GOOD" ROCK GARDEN



ROCK GARDENS

*Good and Bad

By KATHLEEN MARRIAGE

ROCK GARDENS are like children, there are no bad ones except as the result of environment, fault of the grown-ups forming them; so my child-psychiatry pal tells me.

It seems that a Rock Garden can be satisfactory only in the right environment. Of course any setting is condoned if the owner simply aims at making a home for special plants which must have rocks. After all wasn't it to stimulate the splurges of aubretia, primula, saxifrage and other sheets of bloom in the Alps that the first Rock Garden came into being?

What is the right setting? Any that looks natural, preferably one with a background of trees, shrubs, or evergreens, and if possible an unlevel surface; in fact any area will serve which does not include too obviously man-made structures in the same eye-full as the Rock Garden.

There are still those who ask "can't I make a Rock Garden in that corner between the maple and the garage? I can get nothing to grow there." Such a conception develops possibly into a geological museum of questionable interest but never into a rock garden.

For Rocky Mountain residents—The greatest help, more effective than everything to be found in books, is to go out as far as your wartime gasoline will take you and study carefully all the various rock formations you see, making detailed notes. At first this may convey nothing—just different piles of rocks. After a few such studies the order and arrangement of the whole will suggest a definite scheme for the evolving of the same in miniature.

Books that may help in the actual construction and in choice of plants are:

Reginal Farrer's **The English Rock Garden**.
Clarence Elliot's **Rock Garden Plants**.
F. F. Rockwell's **The Rock Garden**.

A close study of nature, a measure of common sense, and a wisp of good taste will guide one to the right plants. There must be enough mat plants to cover much of the surface so that when complete the too-rocky appearance has been softened. There should be enough accent from color, or height, or interest of foliage to avoid monotony.

The real joy of the Rock Garden is the making of pockets to suit the taste of special plants that give piquancy and flavor to the whole project. Such plants par excellence are to be found on our own Colorado Mountain Peaks.

Rock Garden Connoisseurs in England, Europe, and South America go to endless trouble to obtain and grow there mountain beauties while many of us to whom these treasures are available are content with common every day stuff.

The good taste is necessary when an evil whisper comes to your ear "Why not put those Snapdragons, Peonies or Roses in your Rock Garden? It's the sunniest place you've got." Slap 'em down, or give a polite "yes" if you like, but don't ever commit the crime of allowing such unsuitable exotics into your Rock Garden.

*The sub-title is your editor's—not mine.



A "POOR" ROCK GARDEN

GROWING CULINARY HERBS IN COLORADO

By MYRTLE ROSS DAVIS

I BECAME interested in growing herbs when I found that herbs can make insipid dishes most appealing; that they give delightful cooling and stimulating flavors to drinks; that they can give a new and distinctive flavor to ordinary food and in many other ways can aid the housewife in banishing monotony from and gaining fame for her menus. Destiny has made cooking my principal vocation even though at heart and by nature I am a gardener. Therefore cooking and herb gardening has been a happy combination for me.

It is true that many kinds of culinary herbs may be purchased in a dried form at a grocery or delicatessen store but most herbs fresh right out of the garden are as much superior as are fresh vegetables compared to dried ones. I found the difference so great that I grow my winter's supply in pots sitting in a sunny basement window.

I expect to deal principally with the culture of herbs in this article, and shall touch only lightly upon their use in cooking, but I should like to give one word of warning to cooks; when using herbs use a light hand; never overpower with herb flavor the real taste of the food you are seasoning. A friend of mine who has the reputation of being a good cook launched forth one day with an appropriate combination of herbs with the philosophy that if a little is good a lot should be better. As a result her family have since discouraged her in any further attempts in this particular culinary art.

I started collecting and growing culinary herbs a few years ago because, as I have already indicated, I got so much satisfaction out of using them in cooking and also because I love to grow things. I found a great deal written on the subject

but ran into some difficulty in securing any except the most common plants. Local seed stores carry a few plants and several varieties of seeds. Some of the best known herb nurseries in the east cannot ship plants into Colorado because of the Japanese Beetle infestations. I discovered that The Toolies of Baraboo, Wisconsin and Highmead Nursery at Ipswich, Mass., both have large collections of herbs free from infestation. When I ordered from them, their plants arrived in Colorado in good condition and all lived.

In growing herbs you don't need to worry about space to put them. They can be thrown in almost any place among flowers or vegetables or in among the shrubs. I grow about forty kinds in a space not more than ten by ten feet. Herbs thrive in any kind of soil, poor soil preferred. Most herbs need sun but a few like shade. Herbs require a moderate amount of water; too much causes rank growth. Fortunately for the gardener or cook most herbs are very easy to grow. Although they are able to take care of themselves and survive under adverse conditions, almost like weeds, they are most attractive and give the best results if properly planted and cared for.

I have grown all of the herbs described below in my Denver garden and shall give a little more specific information about each of them.

CHIVES — (*Allium schoenoprasum*): It is a perennial, propagated by clump divisions. It is easy to grow. A sunny position is preferred but it does fairly well in the shade. It needs a little fertilizer if it is cut heavily. When chives are transplanted into a pot in the fall for winter use, all the tops should be cut off otherwise it will die. The tender tops are used when a mild onion flavor is desired.

The deep lilac-colored flowers are quite attractive.

PARSLEY—(*Petroselinum hortense*): It is a biennial, usually grown as an annual. The seeds are slow to germinate and will give better results if started in the early spring in pots in a sunny window or in a cold frame. It can, however, be planted in a sunny position in the open in the spring after the ground is warm. If taken up in a pot in the fall reduce the foliage by removing most of the outer leaves. Parsley will live outdoors through the first winter and produce a strong plant the next spring. The leaves are used for flavoring, garnishing, and in salads.

MINT—(*Mentha spicata*), also called English mint, lambs mint or spearmint. It is a perennial. This is the common mint which every one knows. It will grow in a sunny position but has a more delicate flavor if grown in light shade. This plant's fault is that it is a bad spreader and must be kept under control. Other mints are: Apple Mint (*M. gentilis*), a perennial. This mint has a mild fragrance like apples. Pineapple Mint (*M. rotundifolia variegata*) a perennial. This mint has round variegated creamy white and green leaves. It is not as vigorous as the other mints. The young growth has a delicious pineapple odor. Peppermint (*M. piperita*) and Pennyroyal (*M. pluegium*) are not hardy in our climate. All the mints are used in sauces and jellies for lamb and for cool drinks and garnish. A sprig of Apple-mint dropped into hot apple sauce adds a great deal to its flavor. I always cook a mint leaf with green peas. It brings out an extra something which is quite distinctive.

SAGE—(*Salvia officinalis*): This is a hardy perennial propagated from root divisions, cuttings, or grown seed. It will grow in almost any soil and needs full sun. This plant has attractive flowers but may die if allowed to bloom as it

seems to take too much of its strength to produce flowers and seeds. The fresh leaves or newly dried ones are very much better for dressings than the dried or powdered kinds obtained at the grocery store.

TARRAGON—(*Artemisia dracunculus*): A very hardy vigorous perennial propagated by root division. It needs full sun and very little attention. Herb growers in acid soil regions have trouble with this herb but our alkaline soil seems to be just what it likes. Tarragon has become indispensable with our fried chicken, all fish dishes and fish sauces. It is also the basis for the well known tarragon vinegar used in sealed dressings and special meat sauces.

THYME—(*Thymus vulgaris*): Sometimes called Kitchen or Garden Thyme. This plant is a perennial propagated by cuttings, divisions or seeds. Not very hardy, Needs full sun, medium fertile light, fairly dry soil. The young shoots are used for seasoning soups, meat, poultry, sausages, cheeses and gravies. Other thyme plants are: Caraway Thyme (*T. herba barona*) has a flavor of caraway. Lemon Thyme (*T. serpyllum citriodorus*) has a delicious scent of lemon. May be used for flavoring drinks. Wild Thyme (*T. serpyllum*), a hardy creeping variety with lavender flowers. It is used the same as Garden Thyme, although the flavor is slightly different.

SWEET MARJORAM—(*Origanum majorana*). This is a tender perennial, best treated as an annual. Sometimes called the most useful herb but must be used sparingly. It is used with lamb, pork, fish, poultry, eggs, stews, vegetables and soups. The famous fried chicken at Brooks Forest Inn always has a touch of sweet marjoram. Another marjoram is Pot Marjoram (*Origanum onites*), a hardy perennial with attractive flowers. Is a pest if allowed to go

to seed. To be used about the same as sweet marjoram except that the flower heads are used instead of the leaves.

SUMMER SAVORY — (*Satureia hortensis*). This is an annual very easily grown. Plant the seeds very early in the spring in full sun in any kind of soil. It is particularly useful for flavoring beans both green and dried. It is also used in meat dishes.

WINTER SAVORY — (*Satureia montana*). This is a hardy perennial propagated by root division. Its flavor and uses are about the same as summer savory but there is more pungency to the leaves.

ROSEMARY — (*Rosemarinus officinalis*). This is a half hardy perennial. It is started from seed, left in a pot and brought indoors in the winter. No one needs more than one of these plants. Its fragrant leaves are used to flavor roasts and stews, particularly lamb. A leaf of rosemary in the bottom of each muffin tin adds a delicious flavor to muffins.

FENNEL — (*Foeniculum dulce*). This plant is an annual easily grown. Leaves and seeds have a sweet anise flavor and both are used with salads and other dishes, especially fish. It is to fish what mint is to lamb. This is one of my favorite herbs.

CHERVIL — (*Anthriscus cerefolium*). This plant is an annual much like parsley and is easily grown if given light shade. Plant early as chervil dies down in hot weather. It seeds itself and comes up again in the fall. It is used as a garnish and is very good in omelets, fish sauces and salads.

SWEET BASIL — (*Ocimum basilicum*). This is a very easily grown annual. The plant is improved by frequent pruning. It is very tender and must be planted after all danger of frost is past. Its spicy fragrance blends nicely with many dishes. It is especially good with tomatoes.

DILL — (*Anethum graveolens*). An easily grown annual. Will grow any place. Its seeds are used in flavoring pickles, salads and other dishes.

ANISE — (*Pimpinella anisum*). An annual easy to grow whose seeds are used to flavor sweets and pastries.

CORIANDER — (*Coriandrum sativum*). An annual grown for its fragrant seeds. Used to flavor pastries and confections.

CARAWAY — (*Carum carvi*). This is a biennial and takes two years to produce seed. The seeds are used in cookies, bread and cake.

SORREL — (*Rumex scutatus*). An easily grown perennial with large leaves and a sour taste. Its leaves are used in soups, salads, sauces, spinach and omelets.

BORAGE — (*Borago officinalis*). A very coarse hairy annual with attractive star shaped bright blue flowers. It self seeds very readily. Its leaves and flowers add a cucumber flavor to salads. It is also used in cold drinks.

BURNET — (*Sanguisorba minor*). This is a slightly brown herb. It is a biennial easy to grow from seed. This plant has a very delicious flavor of cucumbers. Its flavor disappears when dried but may be preserved in vinegar. A very useful herb and should be grown more.

LOVAGE — (*Levisticum officinale*). A large celery flavored perennial. Propagated by root division. Easy to grow in full sun. To be used sparingly where celery flavor is desired.

LEMON BALM — (*Melissa officinalis*). An easily grown perennial with a very pleasing lemon fragrance. It is a great seeder and spreader and must be kept under control. It is used as a garnish and in cold drinks.

SOUTHERNWOOD — (*Artemisia abrotanum*). This plant is also known as Old Man or Lad's Love. A hardy shrubby perennial. Propa-

gated by root division. Used very sparingly as a flavor for soups. Sometimes used dried to add fragrance to a grate fire in winter.

SWEET CICELY—(*Myrrhis odorata*). A rare liquorice flavored perennial with fern like leaves. The seeds are planted in the fall in shade and they come up the following spring. The plants live for many years. The leaves are used for garnish, cold drinks and salads.

COSTMARY—(*Chrysanthemum balsamita tanacetoides*). Sometimes called Sweet Mary and Bible Leaf. A perennial. An old fashioned sweet smelling herb with long narrow leaves and a coarse sprawling growth. Used in salads and the

dried leaves are used as a beverage tea.

This article is in no way an attempt to give an exhaustive account of herbs. I have only attempted to give a little information about some culinary herbs which I have grown in my Denver garden.

The subject of herbs is a very broad and interesting one. Herbs played a leading part in the gardens of our forefathers. The history of man and of gardening is full of references to and information about the culture of herbs and their uses in cooking, medicine and as deodorants as well as of the folklore, superstitions and legends connected with them.

TWO PIONEERS OF COLORADO HORTICULTURE WITH DEEP GREEN THUMBS.

MR. AND MRS. M. J. WEBBER OF BROADVIEW NURSERY

THE ever open gates of Broadview Nursery typify the gracious hospitality of its owners. Those wishing to buy, those wishing only to know a few among the many trees and shrubs grown by Mr. and Mrs. Webber, receive the same welcome, the same unhurried consideration.

Walking with them through the fields, sharing with them the beauty of apple trees in full blossom beneath the blue sky, the song of a meadow lark high overhead; the color of autumn on maple and oak; brown leaves drifting down in a misty fog; visitors leave confident the richest experiences come to those whose feet tread the soil. Here there is so much to see, to learn, to think, to feel.

Mr. Webber, fourth in a family of six children, spent his early youth on a farm in north central Illinois. His father was the son of a doctor, his mother the daughter of a Methodist minister; consequent both physical and spiritual needs received full attention. Especially did their mother stress ab-

horrence of all things evil. In going to school the children passed a saloon. This they did at full run, holding hands in pairs, eschewing evil at the fastest pace possible for little feet.

There was work to be done every day, but always time for a discussion of general topics, and of the problems and projects of the individual member of the family group. Besides, each child made a contribution to the little orchestra, for music was an interest and an enjoyable recreation.

The younger children were in their early teens when the family moved to Republic County, Kansas. Farming did not interest the five boys, although the growth and development of plants was beginning to appeal strongly to Milton. As the father's health was failing and the sister was not well, it seemed advisable to move to Colorado. While preparations to start were under way the father and sister both died. The mother and her five sons arrived in Denver in 1891.

While Milton Webber and his

brothers were getting the planting of corn "laid by", or were striving to complete the innumerable chores always interfering with the pleasures of a boy on a farm, over in the sister State of Ohio two little girls, Alta and Myrtle Chambers were finding life pleasant and happy on their grandfather's farm near Toledo. Their mother had come here as a bride to a home that had known three generations. She shared with her little daughters the beauty of the rolling farm land. They lived here long enough to remember always the delights of the changing seasons, the wooded hillsides where the violets and trilliums grew, the lush green meadow carpeted with bluets; the brilliant leaves in the fall, the nuts to gather when frosty mornings came. But the farm tasks were becoming too strenuous for the young mother, and this family too moved to Kansas to remain a few years near Atchison, before going on to Colorado. The Chambers family also arrived in Denver in 1891, three days prior to the arrival of Mrs. Webber and her five sons.

Six years later, Alta Chambers met Milton J. Webber, and on June 15, 1899, they were married. A common interest in country living and plant life influenced their search for a home and took them to ten acres of land three miles northwest of Arvada—a small house, several already old apple trees, a scattering of shrubs, and a few peonies. They looked out upon fields and plains, reaching west to the foothills, back of these the snow-capped Rockies, Pikes Peak far to the south, the "Flat Irons", and Longs Peak to the north. Thus Broadview came into being.

The young couple set about at once bringing their dreams to fulfillment, building a house, and establishing a nursery. And it became actually their house. For, aside from help in mixing the cement, and again in laying the

shingles, Mr. Webber built it, even to installing the furnace, and decorated it, unassisted. Completed, it stood an exact duplicate of a colonial home in Salem, Mass. The years have framed it in arching branches of favorite trees, and given it seclusion among the evergreens and shrubs.

Accustomed to luxuriant eastern vegetation and resplendent foliage of the hardwoods, when they planned the nursery they disregarded caution and horticultural warnings by planting trees and shrubs supposedly not hardy in Colorado. And most of them grew. Today a greater variety of fine Oaks and Maples, Lilacs and Viburnums grow here than in any other one spot in Colorado. White birch grew at Broadview long before other nurseries considered them adaptable. Among the Viburnums can be found *prunifolia*, the true Black Haw; *cassanoides*; *lentago*; *dentatum*; *molle*; *acerifolium*; *tomentosa*; *seboldii*; and *rufidulum*, a species of the far south, which has withstood three Colorado winters. *Villosa*, *Josikaea*, *japonica* and *pekinensis* Syringas; *Elaeagnus argentea* and *longipes*; *Euonymus patens*; many beautiful Hawthorns and many species varieties; Alders; Buckeyes; Black Cherry; Iowa Flowering Crab among the many *Malus*. However, Mr. Webber has never urged their planting, and warns of the risk and difficulties, with attendant disappointments.

Peonies were given ample space in the early plantings at Broadview and have claimed as much attention as the shrubs and trees. Over two hundred varieties are now grown. Their blossoms have been an outstanding feature of many flower shows in Denver for the past twenty-five years, their beauty an inspiration for many young home-makers struggling with gardening problems.

Mr. Webber says: "The lure of

the Peony has been irresistible, commanding our best effort. Partly in jest, we have often given expression to the thought that if there be a Heaven, (we have unbounded faith there is), and if we are qualified for admittance, we would submit to St. Peter a plot where Mrs. Webber and I can grow a few Peonies, and there the climate will be agreeable."

Mrs. Webber has been actively associated with the nursery and has been a partner in a very true sense of the word. Their's has been a long, unusually happy and cooperative partnership.

Mr. Webber has been as quick to recognize symptoms in the life of plants as his grandfather was in noting the pallor or vigor of his patients. He is a keen judge of men, as well, a friendly and unassuming man with an unexpected sense of humor. Nor has he failed to observe the precepts of his early training. His knowledge of the

Bible supports his religious convictions and moral standards.

Inherently gracious, ever considerate, Mrs. Webber's many fine characteristics are crowned with a natural and never failing dignity. "Heaven such grace did lend her that she might be admired". Her talents and qualifications, added to a willing contribution of her abilities, have made her a valued member of various groups and organizations.

Their honesty and sincerity, their willing assistance with community projects, their generous contributions of spring blossoms and fall foliage for many occasions, has earned for them respect and admiration. Their knowledge of trees and flowers imparted patiently and repeatedly have helped many to a fuller understanding of the meaning of a garden.

—Anna S. Mellen.

The following remarks are expressions of this respect, and of warm-hearted friendships:



THE WEBBER HOME AT BROADVIEW

I have known the Webbers of the Broadview Nurseries for many years. I believe they are one of the very early propagators of Shrubs, Trees and Fruit stocks in our locality. It has been a great pleasure for me to consult with both Mr. and Mrs. Webber when visiting their grounds.

C. R. Root,
The Colorado Seed Co.

It is a pleasure to me to speak a word of appreciation of Mr. and Mrs. Webber. They have made of Broadview Nursery a place of enchantment, and have brought to Denver some of the more unusual growing things to add to our garden interests.

Mrs. D. C. Eames,
Past President of
The Home Garden Club.

"This is a narrow Arbor Vitae, a fastigate tree, as fine as any tree of this type," said Mr. Webber, as he pointed to four Arbor Vitae in front of his house. "Nobody grows them here. They say they are not hardy, but here they are."

Mr. Webber has grown many new things for the Denver area. I think it is an unusual service which he has given to Ornamental Horticulture in the Denver Region. It is these items which make the beauty of the City of Denver.

I feel that my life has become richer through knowing Mr. and Mrs. Webber. Like most horticulturists they are philosophers, with a view on life which is not centered in money, but in the amount of service they can give our home city.

S. R. DeBoer,
Landscape Architect.

SOUTHERN ROCKY MOUNTAIN REGION WILDFLOWERS FOR COLORADO GARDENS

By GEORGE MORRIS FISHER
Landscape Architect, Lawrence, Kansas.



COLUMBINE

Cut Courtesy Simpson Seed Co.

NO ONE can visit the great natural flower gardens of the Southern Rockies ranges without experiencing a desire to transplant some of the beauty found there to our own garden borders. Attempts to establish some of these natives are often very discouraging, mainly because we know very little about their individual growth requirements and cannot easily provide them with happy homes.

There is certainly no set of rules governing the planting and care of our wildflowers of the Rockies, as they all grow under such widely different conditions. Temperature, soil acidity, or alkalinity, sunshine, moisture and length of the growth season are all important factors in the picture.

But the wide variation of adaptability and great difference in colors and types provides a golden opportunity for the plant lover who would attempt to introduce these mountain wildflowers. Many of them can be worthy of trial by transplanting or starting from seeds. One answer to the difficulty



MARIPOSA LILY

in culture probably lies in plant breeding, and eventually hybrids may be created from many of our westerns which will take a prominent place in our perennial gardens.

In discussing several of the individual species, leading honors will certainly go to the several varieties of the Colorado columbine. We are already quite familiar with the common form of the Colorado State flower, but let us consider some of the more unusual varieties, selecting as one of the best the pure white variety, *leptocerus*, especially well distributed in the Wasatch Plateau of Utah. Here it reaches its greatest glory in among the aspens and firs of the wooded slopes, where its four-inch blossoms dominate the early summer scene. Its range extends clear up to the summits of the highest Wasatch peaks, where it forms dense patches on windswept gravelly slopes.

Or you might search in isolated localities in Northern Colorado for a rarely-found smaller, rich deep-blue spurless variety called *A. corerulea Dailyae*, with smaller petals and generally several extra petals. All of the columbines start easily from seed, gathered when fully ripe. The mature plants should be given adequate porous drainage under and around their

roots and plenty of water during mid-summer dry spells.

Another little gem among the bulbous plants, found so commonly in the lower reaches of the Utah mountains is the mariposa lily, or sego lily as known to many, the State Flower of Utah. It blooms early in the spring on preferred warm, dry clay slopes. Though not quite as exquisite as the Utah species. *Calochortus nuttalli*, the one most commonly found in Colorado, *C. gunnisoni*, is equally well cultivated. These bulbs should be planted quite deeply—to about eight inches, preferably in the late fall. This bulbous genus dislikes conditions of alternate freezing and thawing.

No selection of western wild-flowers would be complete without including some penstemons, which are among the dominant flower genera of the whole Southwest. As one goes westward across the ranges, he will observe that penstemons become more beautiful and striking. They have a wide range of growth habits and a great variation of colors and types, but



PENTSTEMON

generally we can specify hot, dry banks and clay soil for most of them, and these Southwestern penstemons present a case where it doesn't hurt to spare the water. When started from seed they are best planted in the late fall, as they need a period of freezing weather for good germination.

To make a selection of three aristocratic penstemons we could well start with the Wasatch Penstemon, *P. cyananthus*, considered by many to be the most outstanding western blue species. The foliage is evergreen and the stems reach two feet, with large blue flowers extending clear around the stem. Its narrow-leaved variety, *subglaber*, is equally attractive, but of less common distribution.

The most outstanding in the brilliant red-flowering class is the *P. eatoni*, which flourishes under the trying conditions of the desert's edge in Southwestern Colorado. Then high on the mountain summits we find the most brilliant, dazzling, dark blue of all western penstemons, *P. subglaber*. It is generally found growing solitary, flowering for a long period, with individual blooms only on one side of the stems.

Plants preferring rich, moist sites in all of the upper plant zones of the high mountains are the large mountain blue bells, *Mertensia ciliata* and the related forms of *M. leonardi* and *M. sampsoni*. The several western bluebells that are found distributed generally throughout the Southwestern ranges, all closely resemble the Virginia Bluebell, which is cultivated in Eastern gardens; but the western species are by far the largest and handsomest of the genus, and under most conditions do not die clear down to the soil after flowering like the Eastern species.

Dominating the early fall landscape for three to four weeks, in all but the two lowest vegetative ones, are the Erigerons or fleabane daisies. The flowers are very aster-like and they are often confused with the true genus *Aster* by the western traveler. The most outstanding one over much of Colorado and to the westward is called the aspen fleabane. It looks all the world like the little globe-shaped *Azaleamums* of our perennial gardens, loaded down with large, bright purple flower heads. This is a form of *Erigeron speciosus*, quite commonly found in cultivation. They are observed to bloom much earlier in the season under eastern conditions, and if planted in partial shade will bloom for a very long period. They will usually bloom the first year from spring-sown seed. These plants should prove desirable for border massing and also good for cutting.

To complete this all too short list in the allowable space, we should mention an attractive and quite common flowering perennial of the mountains, the *Viguiera* (*Gymnoloma*) *multiflora*, or so-called showy goldeneye or sunspots, as but two of its many common names. Its range extends from the lower edge of the aspen belt to the high subalpine meadows. It is medium tall, many-branched with masses of all-yellow sunflower-like flower heads. It blooms most of the summer on nearly all sites, where its profuse flower heads is often the dominant feature of the floral landscape. It prefers partial shade to full sunlight and thrives in a wide variety of soils. It is difficult to start from its light seed, but the strong, woody root crown divisions start easily. This should be a desirable plant to introduce into our home gardens, and it has been successfully grown in several regions.

In the next issue we will have reports of the Arboretum, Conservation and Forest resources committees as well as a digest of some of the fine talks given at the annual meeting Feb. 15, 16. These reports will show what the Association is doing and planning to do. They should be of intense interest to all members.

MAINTENANCE AND MATERIAL

A few weeks ago a heavy snow on Saturday afternoon made it impossible to do the outside work I had planned, so I went to the Fine Arts Library of the Denver Art Museum (fourth floor of the City and County Building) and spent several hours looking over some old files of garden magazines. One article was entitled "Landscaping the Small Home." It's always a good title; I always read these articles. This one purported to evaluate the elements of sound landscaping. The plan or design counted 80%; material 10%; maintenance 10%. Indeed, the author said that if the plan were sound, it really made little difference **what** was planted.

Balderdash!

Why do we landscape our homes? Hubbard & Kimball in their **Introduction to the Study of Landscape Design** say:

"Man obtains from his environment two things which he desires, **usefulness** and **beauty**, and all material progress in civilization has consisted in his modification of his surroundings to serve these two needs:"

This definition is generally accepted. We landscape to secure shade, and (again quoting Hubbard & Kimball) "to produce an effect

of pleasure in the mind of the beholder through esthetic design." So far as the utilitarian aspect is concerned, material is certainly on a parity with plan. The telephone pole must be covered, and so must the neighbor's wash. We do this by putting a plant in front of each. But the really important thing is **what** we use as a screen. Shall it be an all-year screen or a seasonal one? Shall we use a "leggy" shrub with a week's beautiful bloom, or one with full foliage to the ground? The questions answer themselves.

How about beauty, however? Has true beauty aught to do with maintenance and material? It's a matter of individual taste, I suppose. But I will wager that at least ninety-five percent of Colorado's population (and they are the people we live with—and are) obtain more pleasure from a place that is immaculately neat, with supremely healthy and not too commonplace material in a perfect lawn, than they do from a "sounder" design, that is planted with ugly, uninteresting materials that are neglected besides.

(Any suggestion that these observations are directed toward John Stockbridge is wholly without foundation.)

QUERCUS.



COL. PECK HONORED

Col. Allen S. Peck, 2115 E. 14th Avenue, is one of ten prominent foresters in the United States elected to the grade of Fellow in the Society of American Foresters, according to an announcement received in Denver, recently, from Henry Clepper, Executive Secretary of the Society, Washington, D. C. Election to Fellowship is in recognition of outstanding professional achievement in forestry, and represents the highest distinction that can be

conferred on a member. Since the organization of the Society in 1900 only 55 members have been elected Fellows, of whom 46 are now living.

Col. Peck retired as Regional Forester of the Forest Service two years ago after forty years' service. Since his retirement he has been active as a director of the Colorado Forestry and Horticultural Association, the Boy Scouts Council, and in other public service activities.



THE EXPERTS SAY

Why don't we plant more PINES: Austrian, Mugho, Pinion, Foxtail, Eastern White? Also more informal type junipers: Oneseed, Canaert, and Silver? (*J. virginica glauca*). All tend to soften the severe lines of buildings, both residential and public.

While there is a definite place for the formal sheared-type junipers of many varieties, and the spruces when there is space for them to develop; they are, in many plantings, used to excess, poorly placed and used with little regard for the fully developed landscape.

Substitute desirable shrubs here and there in place of too many evergreens.

Extreme greens, in evergreens, when planted with blue shades, make a pleasing contrast.

The Pfitzer, Sabina and Tamarix junipers, and other spreading varieties, are at their best when allowed to reach their natural proportions with the minimum of trimming. The conical-shape Rocky Mountain juniper, and similar varieties, need not always be sheared. In some locations it is most desirable not to.

Much of this overdone formality is caused by choosing the wrong plant for the location. It soon begins to intrude on view, traffic, ingress and egress to the entrance, and then transplanting, trimming or removal is necessary. Trimming is the less painful financially, and the plant usually becomes onesided, loses much of its beauty and bloom, and takes on a definite hedge or formal appearance.

A little more interest and thought, together with know-how and experience, will make for a more beautiful city.

ROY E. WOODMAN,

Landscape Gardener and Nurseryman.

Plant a "Polly" variety peach tree in your yard and enjoy luscious white peaches, not every year, but frequently. Ours had eight bushels in 1944, and one and one-fourth bushels in 1945.

ROBERT E. EWALT,

Super-back-yard Gardener.

I am always interested in hearing about the SUCCESSFUL use of native plant material. By "successful", I mean, where it is so used that it thrives and looks attractive—not when it is just barely kept alive. RUTH A. NELSON, Botanist.

It's smart to consult your local dealers when some new thing catches your eye in those beautiful new catalogs. The local dealers have your best interests at heart and can help you.

GEORGE BEACH,

Horticulturist, Colorado A. & M. College.

Why do people trim the lower branches from evergreens? They should be furnished to the ground.

Why not plant more oaks? They soon grow up, and last so long.

MRS. D. M. ANDREWS, Boulder, Colorado.

Spray your junipers the first time each spring, just before growth starts. Follow in thirty days with another spraying. Check them for further need every few weeks, and give them a final spraying in mid to late September.

SCOTT WILMORE, Wheatridge Nurseryman.


"Think of the size of the mature plant when you dig the hole for the seedling or division", admonished the Wise Gardener as he carpeted his two-foot hole with inverted sods, filled it with compost and top-soil and planted his choice peony division with the eyes barely covered, so that it would not sink too far in the loose earth and bury itself too deeply for blooming.

MERRY MACK, Gardener.

Farmstead beautification is all the rage just now. Few people realize, however, that the first and very important job in improving the appearance of a farm yard is to give the entire yard a through "house-cleaning". This is a most unromantic task—but it effects a wonderful change.

HARRY GRAVES,

Extension Horticulturist, Fargo, N. D.





The Green Thumb

May — June, 1946

~~~~~ THE GREEN THUMB ~~~~~

A Bulletin of the COLORADO FORESTRY AND HORTICULTURE ASSN.

Organized in 1884

George W. Kelly, Editor

L. C. Shoemaker, Office Manager

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"To preserve the natural beauty of Colorado; to protect the forests; to encourage proper maintenance and additional planting of trees, shrubs and gardens; to make available correct information regarding forestry, horticultural practices and plants best suited to the climate; and to coordinate the knowledge and experience of foresters, horticulturists and gardeners for their mutual benefit."

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PRESIDENT'S ANNUAL REPORT

OUR OBJECTIVES

It is well for each of us to keep constantly in mind the stated objectives of this Association.

"To preserve the natural beauty of Colorado; to protect the forests; to encourage proper maintenance and additional planting of trees, shrubs and gardens; to make available correct information regarding forestry, horticultural practices and plants best suited to the climate; and to co-ordinate the knowledge and experience of foresters, horticulturists and gardeners for their mutual benefit."

To effectively promote and secure the accomplishment of these objectives your board and officers have felt it of **primary** importance to develop, in interest and circulation, its bi-monthly publication, "The Green Thumb." Its fourteenth consecutive issue is just off the press. These issues are replete with information of value to all those interested in our objectives. Considering that this has been done entirely upon a voluntary, contributory basis, it is indeed a remarkable achievement. The Association wishes to thank the editor and all those who have prepared and contributed the interesting and informative articles which have been published in the bulletin.

Except for a very modest expense in maintaining the office, membership files, etc., our receipts from membership dues are largely expended on printing and distributing "The Green Thumb." An even more outstanding publication would result with more frequent use of illustrations, line drawings and color prints. To publish six such issues and to maintain the central office calls for an increased annual budget. This presents a real challenge to the entire membership of the Association to whole-heartedly cooperate with the membership com-

mittee in its forthcoming effort to substantially increase our membership. If every member would actively undertake to, and actually secure, as many additional members as possible the budget problem would undoubtedly be solved, and the continuation and usefulness of the Association and its publication would be assured.

OUR NEW HEADQUARTERS

An interested member of the Association, believing in the worthiness of our objectives and the educational value of our work, has agreed to make available to the Association, rent free and without initial expense, a small, though well equipped headquarters near the Civic Center, close to the Public Library, the downtown activities of the University of Denver and the future Art Museum. This will provide offices for the Editor of "The Green Thumb" and for our Treasurer and Assistant Secretary, and space for the development of a horticultural library and herbarium. These headquarters will afford a meeting place for the board and its working committees and for lectures and other educational work and services to the membership. Our rent free use of the property is envisioned for a term of years, but will be conditioned upon our progressive activity and increasing service.

COLORADO ARBORETUM

The Association will continue to work for the establishment of an Arboretum in Denver, also for the preservation of areas of natural beauty and special botanic interest throughout the state; for better forest practices on privately owned forest lands.

At reasonable intervals it plans to hold institutes such as this, devising programs of interest and educational value and assembling the ablest authorities upon the subjects assigned.

GLADYS C. EVANS
(Mrs. John C. Evans)

EVERGREENS - Their Selection and Care

By ROBERT E. MORE.

2. PRUNING

Evergreens are—or should be—pruned for one or more of four reasons: (1) To remove dead or diseased wood; (2) To achieve a desired form; (3) To bring about a denser foliage; (4) To keep trees in scale.

Removal of Dead or Diseased Wood

Most evergreens require this type of pruning at one time or another. A branch dies from blight, from dogs, or for no ascertainable reason. It is unsightly, and perhaps a menace to the healthy limbs besides. It should be cut off. How much? All that is dead or unhealthy, of course; and enough more to leave no stump. Any stump or projection is a favorable point of entry for bacteria. A stump doesn't form scar tissue, as does a smooth cut. On prostrate evergreens, go back far enough to be cutting living wood flush with a larger branch. (See Diagram A.)

The same principle applies with upright evergreens. With branches over 2½ inches in diameter, use the conventional "three cuts"



Diagram A—Pruning a Prostrate Juniper
(All diagrams by Matt Falk)

to prevent tearing of the bark. (See Diagram B.)

Achieving A Desired Form

This type of pruning ranges from light pruning to achieve correct growth habits to the fantastic creations (called "Topiary Work") that are occasionally encountered abroad. Pruning for form has three basic requirements: proper plant material to work with, an early start and patience. If a globe evergreen is desired, do not try to lop off the top of a mature Ponderosa Pine. The coarse and open growth habit of the Ponderosa Pine is not adapted to globing. A young Black Hills White Spruce furnishes a splendid subject however. Keep a leader from forming, cut off most of the new growth of each branch during the summer, and in a few years a fine globe is obtained. So with formal column junipers. Select one with a naturally slender growth habit. From the time it is a foot high, shape it as desired, and then keep it in this form by clipping off a **part** of the **new** growth each year. Two formal Rocky Mountain Junipers at the home of Mr. and Mrs. J. Churchill Owen are shown on the cover.

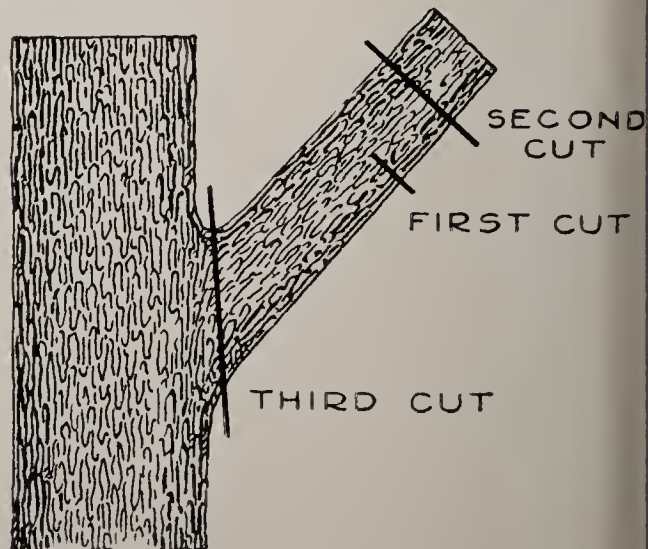


Diagram B—Cutting off a large branch



Topiary Work on Yews in an English Garden. From "Veitch's Manual of Coniferae."

Formal evergreen hedges are a further example of topiary effect. The hedges of Colorado Spruce and Black Hills White Spruce that are pictured in the January 1946 **Green Thumb** illustrate skilled clipping practices. Junipers furnish good hedge material, particularly the Oneseed Juniper of Southern Colorado, a fine specimen of which is shown on the next page.

A lovely hedge of Rocky Mountain Juniper is also pictured in the January issue.

Topiary effects can be achieved to a greater or lesser extent with the following evergreens: White Pine, Mugho Swiss Mountain Pine, (especially adapted to formal effects), Colorado Spruce, Common Douglasfir, Black Hills White Spruce, Japanese Yew, and most Junipers.

Most of this type of trimming is done with hedge shears, once the young evergreen has been made to conform generally to the desired ultimate shape. Once

again, the imperative requirement is repeated: **restrict clipping to new growth of the CURRENT year, and do it as soon as substantial growth has been achieved, WHILE WOOD IS STILL GREEN.**

This type of pruning takes a great deal of self restraint. Once the shears are in hand, the inclination to cut and cut—and cut—is almost irresistible.

The shaping of trees to a symmetrical as distinguished from a formal shape properly comes under the next heading, where specific practices are described.

Stimulation of Dense Growth

Both disbudding and shearing, when properly done, stimulate denser growth and produce thicker foliage. Virtually every young Juniper is regularly sheared up to the time it leaves the nursery, for this very purpose. The same is true with many pines, particularly the dwarf forms of the Mugho Swiss Mountain Pine. Spruces and



Hedge of Oneseed Juniper

Firs are frequently subjected to measures of this sort also.

As different methods of pruning are employed with different kinds of evergreens, it will be well at this point to particularize.

Evergreens vary greatly in their growth habits. Pine buds elongate in the spring until the so-called "candles" are formed. These vary in length from a couple of inches to as much as ten.

After the "candle" has attained its full growth, the "bundles" of needles break forth and themselves elongate. As the needles mature, the "candle" becomes woody and elongates further into next year's branch, on which terminal and lateral buds are formed. If the "candles" are docked just before the needles start growth, a perfect branch results, nevertheless, but a shorter one. (See diagram C.) This results in a much fuller tree. The White Pine first pictured demonstrates the growth habit that results from

regularly cutting off half of each "candle." In addition, the height has been retarded by annual pruning. (This beautiful tree has just been moved to Denver University Campus by the Garden Club of Denver, as a memorial to Mrs. Mary Dean Reed).

The White Pine on the next page is the same height as the other, but the pruned tree is eight years older than the unpruned tree.

For a Mugho Swiss Mountain Pine, simply use hedge shears as shown in the illustration. For upright pines like the White, Austrian, Limber, Ponderosa, etc., cut each separate "candle" with pruning shears.

Spruce, White Fir and Douglas fir can be either disbudded (plucking out the middle bud of each group at the end of each branch with thumb and forefinger, just before the buds "break") or they can be pruned after the new growth has formed, as pre-



White Pine—Regularly Pruned

viously stated. Either of these practices will produce a tree with denser foliage.

Most Junipers are now grafted stock. The reasons for this will be stated in detail in a later article. Suffice it to state here that grafted Junipers furnish the most desirable trees as to color and form, and in addition, make perfect "matching" possible, where duplicates are desired. In the commercial nursery most upright Juniper grafts should be given the support of a wood or metal stake for the first few years. Regular shearing is a further "must." Where only a few trees are to be cared for, hedge shears are all right. For nursery work a heavy knife is faster. Grind a file to a

sharp edge with a slight crescent shape. Carry with you a carborundum stone and keep the edge eternally keen. With a brisk, upward motion, cut off a portion of the new growth in summer, or a portion of last year's growth in early spring. Of course the nurseryman will carefully remove all double leaders.

Ordinarily, the homeowner purchases from the nursery a three to five foot Juniper that has been carefully staked and pruned to give it the best in the way of



White Pine—Unpruned

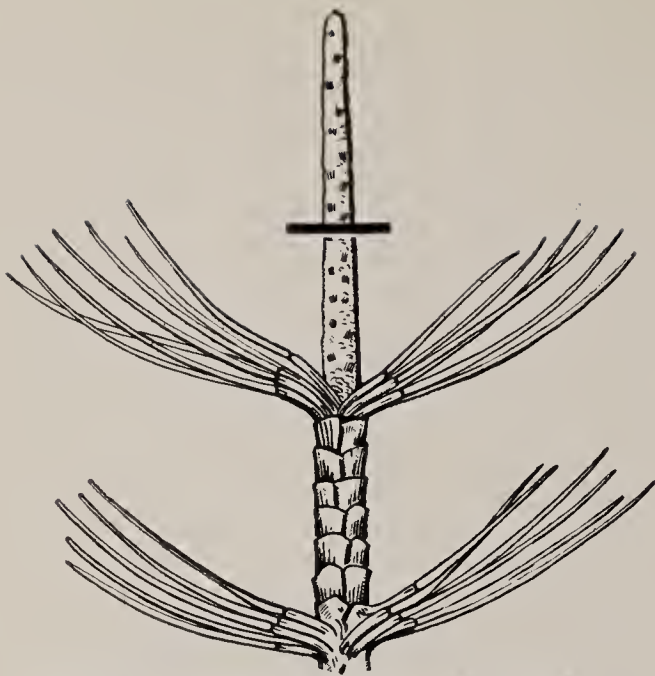


Diagram C—How to cut a Pine Tree
“Candle”

growth habit and form. If a strictly formal tree is desired (and these, in the writer's opinion, are **much** too numerous), start with your hedge shears the first summer—and keep it up. If the tree is to be allowed to assume something of its natural form (which is more beautiful in almost every case), then don't do any pruning the first year, after purchase from the nursery, but thereafter dock a portion of the new growth each year, **using pruning shears on each individual branch**. By using pruning shears instead of hedge shears, formal regularity is avoided, but a stimulation of growth achieved. The Canaert graft of the Eastern Redcedar, like all of the Virginiana group, gets quite open and sprawly if allowed to grow according to its own inclinations. By docking the tips of individual branches, however, a magnificent specimen like that shown below can be obtained.

Keeping Evergreens in Scale

It is best to secure a tree that will keep in scale **naturally**, and then prune only enough to stimulate thick growth, letting the tree assume its natural shape. But this is seldom possible for several rea-

sons: (1) There are only a few evergreens that never get out of scale around the small home. (These will be listed in subsequent articles). (2) There are so many desirable trees that can be kept in scale by pruning for a good many years and still not be objectionably artificial. (3) It takes too long for the true dwarfs to give the desired effect.

For these and other reasons, most of us will have at least a few evergreens that must be retarded—and finally removed. The methods have already been stated, except as to prostrate and low Junipers. To retard growth of these, cut off the larger branches at the points indicated on Diagram A.



Lightly Pruned Canaert
Eastern Red Cedar



Cutting the "Candles" on a Mugho Swiss Mountain Pine

Do not cut the tips unless formality is desired; the whole character of the shrub is lost by merely lopping off the branches. It is generally felt that Pfitzer, Savin, and Tamarix Junipers should never be pruned unless absolutely necessary. The great charm of the Tamarix and Savin Junipers is found in their natural symmetry. This is usually lost through pruning. In the case of the Savin, cutting away lower branches invariably makes it "leggy," besides. The Pfitzer's great value lies in its picturesque irregularity and this is usually lost by pruning.

With Spruces and Firs, retarding sometimes makes the growth so dense that a few branches must be taken out to make the tree look normal. Such thinning should be done at the trunk, making a smooth cut without leaving a stump.

In conclusion, remember that too little pruning is better than too much. Once harm is done, it can seldom, if ever, be repaired.

The technical names of trees mentioned above are as follows (Technical names should always be used in ordering from nurseries, except in the case of the so-called "clons" which are propagated by grafts and cuttings only):

Black Hills White Spruce (***Picea glauca densata***) Colorado Spruce (***Picea pungens***). Common Douglasfir (***Pseudotsuga taxifolia***), Japanese Yew (***Taxus cuspidata***). JUNIPERS—Canaert Eastern Redcedar (**Clon of *Juniperus virginiana***), Oneseed Juniper (***Juniperus monosperma***), Pfitzer Juniper (**Clon of *Juniperus chinensis***), Rocky Mountain Juniper (***Juniperus scopulorum***), Tamarix Juniper (**Clon of *Juniperus sabina***). PINES—Austrian Pine (***Pinus nigra***), Limber Pine (***Pinus flexilis***), Mugho Swiss Mountain Pine (***Pinus mugo mughus***), Ponderosa Pine (***Pinus ponderosa***), White Pine (***Pinus strobus***), White Fir (***Abies concolor***).

WEED-FREE LAWNS A FACT

By ARMIN BARTELDES

Through the miracle of organic chemistry, many weeds that infest lawns and fields can now be utterly destroyed by ordinary garden spraying methods. The secret of this new weed killer is the plant hormone known as 2, 4-D.

The advantages of 2, 4-D over old-time weed killers are that it is non-poisonous, does not injure most lawn grasses, does not burn skin, soil clothing or stain walks. It does not corrode spraying equipment, has no lasting bad effects on soil, creates no fire hazard, is easy to handle and very inexpensive.

HOW 2, 4-D WORKS

2, 4-D is taken into the leaves of the weed and permeates the plant to the very root tips. First symptoms of death are a rejuvenation of the weed, caused by abnormal over-stimulated growth of cells within the stems and roots. In 3 or 4 days the leaves and stems twist and bend; then in 4 or 5 days the leaves turn various colors until, in about 30 days, they dry up. While this goes on above ground, the roots are swelling, splitting, disintegrating. The result is an utterly destroyed weed.

We treated over 100 lawns in Denver in 1945 with perfect results using our own products which contain 70% 2, 4-D. We also tried out several other brands and found that any 2, 4-D formula does the work. Some products are lower than others in 2, 4-D and require more material and more water to cover a given area than others. We prefer the 2, 4-D in powder form as it is easier to measure and has no burning effect even on Bent Grass while some of the liquids did discolor Bent Grass in warm weather.

The time of application is very

important. The weather should be warm and the weeds in an active growing state. Dandelions should not be sprayed until they are well in bloom.

Besides Dandelions, the other most troublesome weeds in lawns in Colorado are Plantain, Chickweed, Speedwell, Ground Ivy, Yellow Trefoil, Dock and Yarrow. These are all readily killed. Two bad weeds are Spotted Spurge and Crab Grass, which unfortunately are not readily controlled with 2, 4-D; especially Crab Grass.

TAKING EACH WEED SEPARATELY

Dandelions, which need no description, should not be sprayed before they come into bloom and can then be sprayed anytime during the summer and as late as October 15th, unless cold weather interferes.

Plantain—there are 2 or 3 varieties in this area. Broadleaf or black-seeded Plantain is the most common; it has a broad flat leaf with a round seed pod resembling a ratstail. The narrow-leaf Plantain has more of an appearance of the leaves of a dogtooth violet and is called Buckhorn. All types of Plantain are easily killed. They may be sprayed when they have fully-developed leaves—which in Denver is around the middle of April. They cannot be sprayed as late in the fall as Dandelions—not after October 1st.

Chickweed—two varieties are prevalent here. The mouse-eared has dark green foliage with small almost round leaves covered by small hairs and produces small white or pink flowers. It grows in round clumps or patches. The perennial type is lighter green with narrower leaves; patches are more irregular than the mouse-

eared. It seldom flowers but when it does the flowers are white. Can be sprayed anytime during the growing season.

Speedwell is another very small plant of light green color and light blue flowers. Should be sprayed between April 1st and August 1st.

Ground Ivy—Healall. All have round leaves and look like a patch of small plantain. Spray April 1st to October 1st.

Yellow Trefoil—has yellow flowers, looks like clover and is often called Japanese Clover. Spreads by runners. May be sprayed anytime between April 15th and until frost.

Dock is not so common. Has a leaf something like a Dandelion but larger. Does not flower in a lawn. May be sprayed anytime when leaves are developed until frost.

Yarrow—forms a dense mat with fern-like leaves. Does not flower in a lawn. May be sprayed from April 15th until frost.

The dense-growing weeds—Chickweed, Ground Ivy and Yarrow—should be sprayed a second time, two weeks after the first application.

Dandelion, Plantain, Dock, Speedwell and Trefoil are usually killed with one application but if they are not dead within four weeks after the first spraying treat them again. Some weeds may be missed or weather conditions may not be just right.

Spurge is a gray-green weed with two small red spots on the base of the leaves. It has a small single root. The plant has a tendency to spread out over the top of the grass and when crushed gives off a milky fluid. We were able to kill Spurge by spraying it while it was young and tender but did not kill it later in the season.

Crab Grass—also called August Grass. Sprouts in early June and grows quite rapidly crowding out other grasses, turning brown in fall and producing an abundance of seed for the next year's crop. 2, 4-D sprays have little effect on Crab Grass when sprayed at $\frac{1}{2}$ inch height.

Clover in lawns may be injured or killed when sprayed with 2, 4-D. Midsummer spraying has less effect than early or late spraying.

HOW TO APPLY

All 2, 4-D sprays must be mixed with water and sprayed on the weeds so that the leaves are well-wetted. A tank sprayer is the most suitable. These are also called compressed air sprayers and have a capacity of from 2 to 4 gallons. A single-action hand sprayer can be used for spraying individual weeds but would be too tedious for an over-all coverage. Hayes Jr. and other types that attach to the garden hose have also proven satisfactory.

A WORD OF CAUTION

Most flowers, roses, other ornamentals and most vegetables are very susceptible to 2, 4-D and care should be taken not to spray them. Do not spray on a windy day as the material may be blown over on valuable plants as well as being lost in the air.

After using 2, 4-D and before spraying ornamentals or vegetables be sure to wash out the sprayer several times according to the manufacturer's directions.

Do not spray when the grass is wet (following a rain or heavy dew.) The ground should be moist (not bone-dry.) Do not sprinkle within an hour following the application.

Do not cut the grass within 3 days following the application.

NATURAL RECOVERY FROM CROPLAND

By G. E. KLIPPLE

MAN has been a chief factor disturbing the natural forces which maintain the plant cover of the earth's surface. He has cut down or burned much of the virgin timber and broken the sod of prairies and plains in his struggle for food, clothing, and shelter. Early settlers of the front range of the Colorado Rockies turned to cultivated crops to increase the food supply. Many acres of foot-hill valley land were cleared and broken out for crop production. Cultivation proved unprofitable after a time and now many areas have been abandoned to the natural forces influencing the region. Nature has accepted the responsibility and is doing her very best to heal the man made scars and cover the old fields with a blanket of permanent vegetation.

We are interested now in the way nature works to get the job done. In the course of a study by the Rocky Mountain Forest and Range Experiment Station, (1) to determine means for the rehabilitation of abandoned crop lands in Manitou Park we had an opportunity to observe the changes taking place on land that had been out of cultivation for periods of 3 months to 62 years. This wide range in the time during which nature's reclaiming forces have been at work in different fields gave us a fine chance to study the early, medium, and late stages of recovery.

The plants which offer first aid to abandoned fields are lowly barnyard weeds such as pigweeds, lambsquarters, knot-weeds, sunflowers and foxtails. Their sturdy, branched stems break the force of late summer's violent thunderstorms. They dry to a rather persistent stubble which holds winter's snows in place. Two or three seasons of this vigorous first aid

treatment makes it possible for the more healing perennial weeds and some grasses to become established. One-sided penstemon, butter-and-eggs toadflax, and trailing flea-bane usually are the first of the perennials to appear. They are conspicuous due to the flower garden appearance their almost pure colonies give the old fields for a year or two. Other perennial plants like milk-vetch, thistle, dandelion, hairy goldaster and tumblegrass add their bit by invading the colonies of early perennials thereby developing a typical mixed weed plant cover. Weedy plants are dominant for eight or ten years after cultivation has ceased.

Soil building grasses like wheatgrass, needlegrasses, blue grama, and mountain muhly appear as single plants soon after the perennial weeds take over from the annual weeds. They pass unnoticed for several years unless we look carefully for them. Their fibrous roots are working steadily to increase their hold on the land. Gradually they gain strength and become able to compete on an equal footing with the weedy plants. This medium stage of the recovery is characterized by a mixed grass-weed plant cover. Here and there young ponderosa pines and Douglas firs, survivors from seedlings established during the weed stage, push their tops above the surrounding vegetation. Shrubby plants like fringed sagebrush and rose bushes usually have become established to some extent by the early grass-weed stage.

Changes in the plant cover become less abrupt as the time since cultivation increases. Nature does make slow but steady progress unless she is hampered by retarding factors such as erosion and heavy grazing use of the vegetation. The

grasses become more prominent and the weeds less so. There are changes also in the dominant grasses. The wheatgrasses and stipas give way to the gramas and mountain muhly. As the humus content and water holding capacity of the soil improve other species such as Arizona fescue, sedges, western yarrow, geraniums and groundsels become established. These species together with mountain muhly and little bluestem are the most abundant species found on areas which never were plowed. On the other hand the first aid annuals have not entirely given up. Individual small and unthrifty pigweed, lambsquarter, and sunflower plants still producing viable seeds can be found in bare spaces between grass clumps, 30 to 40 years after cultivation was stopped.

As the soil building progresses during the late stages of recovery the grasses take over more and more of the ground space. Plants of the numerous species compete with one another for the sunlight and moisture they need. Changes are gradual from season to season. Nature is striving for the best pos-



A First Year Annual Weed Crop in the Foreground with an Early Medium Recovery Field in the Middle Background.

sible balance between the grasses, weeds, and shrubs as she weaves her protecting blanket of vegetation for the life giving soil.

An Advanced Medium Recovery Field Abandoned About 15 Years but Protected from Grazing for the Past Ten Years.



DECIDUOUS TREES FOR COLORADO PLAINS

Our zones 7 and 9 cover the northern and central plains area of the state. Growing conditions here are generally very difficult, but some protected valleys and irrigated districts may be able to grow almost any tree suitable for the Denver area as given in our list of several months ago.

Trees are here listed more or less in order of their hardiness or usefulness. About the first quarter of the lists shows trees suitable for the most difficult places. In the next half are those which usually thrive under more favorable conditions. The last quarter shows those which are only occasionally seen in the area.

In submitting these lists we recognize that many of the very best trees for this part of the state are among the evergreens, but these will be listed at another time.

A little care and thought given to planting, watering and cultivating will make it possible to raise many more trees in this area. The protection from wind and hot sun that trees give is especially appreciated on the plains. Their value as soil binders, as protectors of wild life and eventually as fuel makes them worth a great deal. More street trees and more shade trees around homes will help to make this part of the state more beautiful and a better place in which to live.

LARGE TREES FOR STREET OR YARD

Gleditsia triacanthus, HONEYLOCUST—One of the best for planting under difficult conditions. Slow growing and exceptionally resistant to drought and insect attacks. Picturesque growth habit.

Celtis occidentalis, COMMON HACKBERRY—More difficult

to transplant than Honeylocust, but equally attractive and drought resistant.

Fraxinus pennsylvanica lanceolata, GREEN ASH—Slow growing and drought resistant.

Ulmus pumila, SIBERIAN ELM—While too fast growing and easily broken for irrigated areas, this tree is very drought resistant and when grown with little water it makes a sturdy tree.

Populus sargentii, WESTERN BROADLEAF COTTONWOOD—A native tree which is very appropriate for this area. It requires only occasional irrigation. A better tree than imported poplars.

Ulmus americana, AMERICAN ELM—Much slower growing than the Siberian; but a sturdier tree. Not as liable to attacks of scale in thinner populated areas as it is in cities.

Robinia pseudoacacia, BLACK LOCUST—A very hardy tree, beautiful and useful, but severely damaged by borers in most parts of the state.

Juglans nigra, BLACK WALNUT—Probably the only nut tree for the plains. Makes a nice shade tree, but grows very slowly and likes deep rich soil.

Quercus macrocarpa, BUR OAK—This oak seems to tolerate our soil better than any other. Difficult to transplant and very slow growing.

Acer negundo, BOXELDER—Subject to attacks of various bugs and galls, but can be grown where almost no other tree will live.

Catalpa speciosa, NORTHERN CATALPA—A beautiful and useful tree. Drought resistant

but frequently kills back in winter.

Fraxinus americana, **WHITE ASH**—Similar to Green Ash but not as popular a tree:

Acer saccharinum, **SOFT MAPLE**—A beautiful tree, but must have more moisture and better soil than most of the preceding.

Morus alba tatarica, **RUSSIAN MULBERRY**—Subject to more or less winterkill, but is much appreciated for its fruit where it can be given some protection and water.

Populus acuminata, **SMOOTH-BARK POPLAR**—Of cleaner appearance and more upright growth than the Broadleaf Cottonwood.

Populus agustifolia, **NARROW-LEAF POPLAR**—Native of higher altitudes but will grow on the plains if it has sufficient water.

Populus canadensis eugenei, **CAROLINA POPLAR**—Once extensively planted, but much inferior to our native cottonwood.

Populus alba, Cl. **BOLLEANA POPLAR**—The most beautiful of the columnar type poplars. Must be kept growing vigorously to resist disease and insects, and when it grows vigorously it soon chokes out all adjacent vegetation.

Populus simoni, **SIMON POPLAR**—Similar to Lombardy but possibly hardier.

Populus alba, Cl. **SILVER POPLAR**—Will stand more drought than most other poplars. Large, spreading growth with silvery bark and leaves.

Populus nigra, Cl. **LOMBARDY POPLAR**—Once the most popular columnar tree. Subject to blight and insect attacks.

Salix alba vitellina, **YELLOW-STEM WILLOW**—Easily grown in moist places.

Salix babylonica, Cl. **GOLDEN WEEPING WILLOW**—The most beautiful of the willows. Very appropriate next to a stream or pond.

Betula pendula, Cl. **CUTLEAF WEEPING BIRCH**—One of the most beautiful trees grown, but must never be planted where its roots will ever dry out.

Acer saccharum, **HARD MAPLE**—Rarely found in this area. Slow growing and must have moist protected place.

Tilia americana, **AMERICAN LINDEN**—Beautiful tree, but must have protected location.

Gymnocladus dioica, **KENTUCKY COFFEETREE**—Slow growing habit like Black walnut. Very attractive.

SMALL TREES

Elaeagnus angustifolia, **RUSSIAN OLIVE** Very drought resistant and adaptable. Makes good hedge, tall shrub or shade tree. Beautiful silvery leaves, fragrant flowers and fruit for birds.

Prunus americana, **AMERICAN PLUM**—Hardy and adapted for thickets, windbreaks and backgrounds. Sometimes worth while for the fruit.

Salix amygdaloides, **PEACH-LEAF WILLOW**—A small native willow for planting along streams and reservoir banks.

Robinia neomexicana, **NEWMEXICO LOCUST**—Smaller than Black locust and supposed to be more resistant to the locust borer. Beautiful flowers and a good soil binder.

Ailanthus altissima, **TREE OF HEAVEN AILANTHUS**—Will grow under difficult conditions, but frequently kills back in winter.

Crataegus intricata, **THICKET HAWTHORN**—Slow growing and hardy. Beautiful in flower and fruit.

Malus baccata, SIBERIAN CRAB-APPLE—Hardy enough but frequently damaged by blight.

Malus ioensis, Cl. BECHTEL CRABTREE—A very beautiful tree where it can be given a little protection and care.

Prunus pennsylvanica, PINCHERRY—Attractive in flower and fruit. Usually grown as a large shrub.

Prunus siberica, SIBERIAN AP-RICOT—Reasonably hardy. Usually blooms and sometimes fruits.

Rhus typhina, STAGHORN SUMAC—This will stand much drought and poor soil. Can easily be trained as a small tree.

Caragana arborescens, SIBERIAN PEASHRUB—Usually grown as a tall shrub, but can be trained as a tree. Very drought resistant.

Tamarix hispida, KASHGAR TAMARIX—Will stand

drought and alkali. Usually grown as a shrub.

Populus tremuloides, QUAKING ASPEN—Our beautiful native poplar from the mountains will sometimes grow in moist places on the plains.

Euonymus europaeus, EUROPEAN EUONYMUS—Makes a nice tall shrub or small tree.

Aesculus glabra, OHIO BUCK-EYE—A very attractive, slow growing tree for protected places

Juglans rupestris, TEXAS BLACK WALNUT—Rapid growing tree, but small nuts.

Malus pumila, COMMON APPLE Many varieties of apples will grow and fruit if given care. They are valuable both for fruit and shade.

Prunus various, CHERRIES and PLUMS—Sour cherries and many of the hardy plums will provide both beauty and fruit, if given care.



MY GARDEN

A glad, sincere, and thankful song of praise,
Unto the gods of fruitfulness and dearth,
Each hour of every summer day, I raise,
For all green things which grow upon the earth.

Green things, which spring to life anew each year,
Are symbols of some great eternal plan;
And, one and all, as freshly as they appear,
Revive the hope and calm the fears of man.

Much happiness and sweet content they bring,
In pleasant, sunny hours outdoors, to me;
In loveliness of leaves and flowers which spring
From living, growing plant and shrub and tree.

Therefore it seems, to compensate for toil,
My garden yields green things for which I yearn,
While I, in turn, pay homage to the soil
From whence they came—to which I shall return.

—Len Shoemaker.

DO WE NEED STATE PARKS?

Every citizen of the state should be interested in the suggestions herein stated that we preserve spots of scenic, historical or horticultural interest by setting them aside as state parks.

At the annual meeting of this Association February 15th, Irvin J. McCrary, Chairman of the Scenic and Recreational Resources Committee, submitted a report recommending that the Association make every effort to have established a system of state parks. This, Mr. McCrary felt, would be the most practical way to preserve and make available for the best use many spots of interest in the state. The Committee recommended that there be a survey made to discover and list places of interest that should be established as state parks. They also recommended that the Association investigate what other states had done along this line and how these parks were managed and used. They felt that we might well work in co-operation with such organizations as the State Historical Society, the Colorado Mountain Club, Izaak Walton League and Garden Clubs. They suggested that management of these parks be in the hands of a State Park Board appointed by the Legislature, and composed of experts in various appropriate lines.

In Mr. McCrary's report he makes the following statements:

"In considering the opportunities for outdoor recreation in Colorado, one is struck with a curious fact—that this is one of the very few states in the Union which has made almost no attempt to establish a system of state parks. It is true that a large portion of our most spectacular mountain areas is under public control, and is ably managed by the National Park Service and Forest Service. But the same is true of other western states which have found it also to their advan-

tage to create state parks. California leads the nation with about 316,000 acres in its state parks, South Dakota has 108,000 acres and Minnesota nearly 83,000 acres. Until recently at least, Colorado had but one state park, comprising 120 acres, the site of Pike's Stockade in the San Luis Valley, and the existence of this park is unknown to most of our citizens.

It is the opinion of this Committee that we have many areas with distinctive scenic, scientific or historic interest which belong in a system of state parks. No agency other than the state government can be expected to acquire these areas which should be open to public use and enjoyment. As an example of commercial exploitation one remembers the incongruous board fence at the top of the Royal Gorge, so placed as to conceal the view until the visitor had paid his entrance fee. Another case in point, it is said that unless steps are taken soon to preserve a portion of the pinyon grove northwest of Fort Collins, an unique growth in the locality, the grove is likely to be wholly destroyed.

While we are all acquainted with the scenery of the mountains, few people are aware of the fact that there are on the plains areas of unusual interest such as "The Breaks" at the headquarters of Beaver Creek near Limon, and the wilderness of the Purgatoire Canyon country south of La Junta, replete with Indian pictographs, dinosaur tracks and beautiful red rock formations."

This plan would provide for preservation of many of the spots of horticultural interest as recommended by the Botanical Garden Committee, and would work in well with their plans for "Altitude sub-stations" of the proposed Colorado Botanical Garden.

COLORADO BOTANIC GARDENS

At the annual meeting one of the most stimulating reports was that of the Botanic Garden Committee. It is to be regretted that space is lacking to print the entire report.

The Committee first reviewed the various locations that have been considered, and abandoned—at least temporarily. **Overland Park** lacked accessibility and attractiveness, the **Clay Pits North of Denver University** had poor soil, and **City Park** is dependent upon an already inadequate mill levy.

The Committee then suggested that a **Series of Gardens** through **Conservation** offered limitless possibilities.

"The plan would include the protection of small areas, by fencing, or guarding them otherwise. There would be a garden of mature, big and beautiful Colorado Spruces a collection of mature Yellow Pine; a collection of White Fir; a garden of Colorado Yuccas; of Tree Cactus; of Native Larkspur, etc.

"Such a series of Botanic Gardens would therefore be spread over the whole state and perhaps even beyond. It would need the cooperation of many of the cities, counties, and institutions of the state. Each one of the commun-

ities which has such a nature asset near its borders would be encouraged to submit its site as the official location, or one of the official locations for the Botanic Garden for the variety of plants growing there. Selection should be made by a plant expert in the employ of the Forestry and Horticulture Society. The area should be fenced and policed by the community, or in some cases by the State Institutions nearby.

"The spots set aside for this purpose must be well marked in order that visitors may find their way to them easily. They must also be such that they become tourist attractions for the summer guests of the state. Trees and plants must be labeled, access roads built. All places should be marked on a Botanic Tour Map of the State of Colorado, and copies of this map must be available at nominal cost."

Here is a simple, workable, inexpensive way of making a start upon a State Botanic Garden, which will, as a by-product, expand the sphere of the Colorado Forestry and Horticulture Association greatly. If you have any suggestions, along these or other lines, will you not mail them to the Botanic Garden Committee of the Colorado Forestry and Horticulture Association, 1608 Broadway, Denver 2.

REPORT OF FOREST MANAGEMENT

By ALLEN S. PECK, Chairman

Your Forest Management Committee concerns itself with the activities of the Association in the fields of commercial forestry, windbreak and shelterbelt planting, management of wild lands and related matters. The over-all purpose of the Association in these fields as approved by the Board of Directors on November 8, 1944, "will be to plan and work for the best ultimate disposition and subsequent management of all wild lands in the state, regardless of ownership, with the object of assuring their highest

permanent use. (The term 'wild lands' is here used to include lands bearing forest cover, oak and other brush cover, and also rangelands, whether interspersed with forested areas or lying above timberline or on the plains.) A first step will be the encouraging and supporting of an inventory of the natural resources of these wild lands."

Such an inventory of forest resources was made during the past year by J. Lee Deen, Dean of the Forest School at Colorado A. & M. College and one of your Direc-

tors, under the sponsorship of the American Forestry Association.

In implementing the objectives of your Association the Committee hopes to help promote good conservation practices on both publicly and privately owned forest and range land; encourage forest planting including shelterbelts; promote public assistance to land owners by means of technical advice and protection against fire, disease and insects; promote co-operation between land owners and public land managing and technical agencies; encourage legislation which will give the state a "forestry code" requiring that forest and range land be so managed as to be kept

reasonably productive; encourage instruction in colleges and schools on the importance of conservative handling as opposed to exploitation of natural resources.

Your Committee proposes to co-operate with, support and offer constructive criticism to, when warranted, Federal land managing and research agencies; also to cooperate with the State Board of Forestry, Land Board, Department of Game and Fish, and College of A. & M. A., in securing adequate appropriations and best possible personnel for research and for exercising leadership in the practice and training for good wild land management.

MAIDENHAIR FERN

Some time ago you published in the Green Thumb a request that members report any plants growing away from their natural habitat. I wonder if you would not be interested to know that we have a beautiful growth of maidenhair fern, the southern maidenhair, Venus-Hair Fern, *Adiantum capillus-veneris*, on the damp cliff over hanging Cliff Palace Spring in the Dolores River Canyon, between Gateway, Colorado and Uravan, Colorado. Mr. Wherry, I believe of the American Fern Society, has mentioned this fern as growing in this spot. Not knowing exactly what it was, I took my mother, Mrs. W. C. Ferril, of Denver, to this rather remote spot, and she identified it, a year or two before Mr. Wherry made mention of it. I am not trying to be a "first" in the finding, but the day that my mother first saw it

she received the thrill of her life. Other picnickers at the spot that day thought they were columbines and we did not inform them differently because we thought it gave the ferns some measure of protection. Mr. Wherry said in his report that there used to be a growth of this fern on the damp cliffs in Box Canyon, Ouray, Colorado but it disappeared after a cloudburst. I have searched those cliffs for further signs of it but believe none is there. It has been reported somewhere in Utah, but I do not know where. Isn't it strange that the spores of this moisture loving Southern maidenhair should have become established in such a dry western canyon and where the winters are cold?

LUCY F. ELA

Grand Junction, Colo.

XANTHOCERAS SORBIFOLIA

The July-August issue of "The Green Thumb" just came to me as a sample copy. I was very glad to see the list of deciduous trees for plant zone IV, particularly the lists of small trees, for this information will help me in making selections for my future plantings. *Xanthoceras sorbifolia* is seldom mentioned in catalogs or planting lists, so I was glad to see the favorable comment on it.

Xanthoceras has been growing in my yard for about 15 years, and, so far, could be classed only as a tall shrub. For hardiness and dependability it equals *Lonicera tatarica*, the "iron-clad" shrub, in my garden. It went through the great drought of 1934 to 1936, and seemingly was not damaged, while many others of my shrubs died. Then that devastating freeze of November 11, 1940, which killed whole groves and orchards, did not even kill the blossom buds on the *Xanthoceras*. In bloom the first week of May here, it is a veritable snow-bank. I know of no other plantings of this shrub except one in Lincoln, Nebraska, and the one in central Nebraska where my plant originated. That original tree was more than 30 years old. It had been purchased for \$3.00 from a "horse-an-buggy" salesman who sold it under the name of "Mexican Buckeye."

It is said that the Chinese roast and eat the seed. I have distributed all the seed of mine for propagation, so have not tried eating them.

In the Smithsonian publication, "Plants Collected by R. C. Ching



Xanthoceras—Photo by
Mrs. Paul Murdock, Nehawka, Nebr.

in Southern Mongolia and Kansu Province, China" is this statement: "A single stately specimen of *Xanthoceras sorbifolia* was seen, its profusion of white paniced flowers making it unsurpassed in beauty by any other species."

Mrs. Paul Murdock,
Nehawka, Nebraska.



Most Victory garden plots have been worked overtime the past three seasons, and the soil therefore has become somewhat depleted. We recommend a large application, under the circumstances, of barnyard fertilizers, sludge or chemical fertilizers, which ever one is the most available. Secure your barnyard fertilizers from reliable sources, who have not adulterated the product.

J. A. BIXBY, Denver City Forester.

M. Walter Pesman and George Beach have called our attention to an excellent book published in 1941 by the Oxford Press entitled "Maintenance of Shade and Ornamental Trees" written by P. P. Peroni. This gives the latest information on tree care by a leading expert, and may be adapted to fit Colorado conditions.

THE EXPERTS SAY

Did you know the most common cause of diseased Peonies and consequently no blooms, or blooms of poor quality, is from planting too deep?

Plant your Oriental Poppies deeper and cut down your mortality.

SCOTT WILMORE, Wheatridge Nurseryman.

Community forests afford opportunity for people in all walks of life to gain some appreciation of the relation of forests to the industrial and cultural life of the country, and so become better prepared to think clearly on national forestry issues.

Other benefits of community forests take the form of protection for the domestic water supply, a source of wood for people on relief, a backlog of work for the unemployed, or a place for outdoor recreation. Schools use them as nature laboratories. Community forests may appropriately be established as living memorials to local men who gave their lives in the war.

LYLE F. WATTS, Chief Forest Service.

During the war period, the quality of succulent green vegetables, fresh from the home garden has become known to millions of people who never knew before how delicious fresh garden vegetables could be. Their supreme flavor, their tenderness, their nutrition and their appearance on the table make them a diet fit for kings.

The importance of vitamins in vegetables is especially valuable in the human diet, and it is a scientific fact that stale vegetables have a serious loss in the important vitamins. The quicker fresh vegetables are consumed, frozen, or processed after being harvested, the more delicious they are.

J. A. BIXBY, City Forester.

Something may be said for crowding plants, always provided the soil is rich and other conditions good. With sufficient plant nutrients, a closely planted border will furnish more bloom and growth dense enough to shade the soil and keep it in good tilth without cultivation.

MERRY MACK, Gardener.

Gooseberries have done quite well in borders and have good fall color. Nanking and Sandcherry make a good hedge. We trimmed red Raspberry to hedge form and still had a good crop of berries. Gooseberry and Currant make a good enclosure for a kitchen garden. Elderberry seems hardy and makes good color and texture variety when mixed with the yellow leaf variety in background.

ROY E. WEST, Westgardens, Fort Collins.

I wish something could be done about the Box Elder trees. I know they are not being planted but they attend to that job themselves by their myriad seeds.

I wrote to the entomologist at the State Agricultural College and he said that doing away with the trees would be the only way to exterminate the beetle. I have not "suffered in silence" but have howled to high heaven when I could get a listener. In fall when these beetles, or "brick bugs" as they are commonly called, are trying to get in for hibernation the south side of my house fairly swarms with them. There is no crevice too small to keep them out, and several times each day I go through my rooms and basement killing them by the hundreds.

I am wondering if "The Green Thumb" could help in any way by educating public sentiment. It is awful to walk under the trees and come out draped with cobwebs and decorated with green worms.

LOUISE BROOKS, Gardener.

I wish someone would explain just which Narcissus should properly be called "Daffodils" and which "Jonquils."

C. R. ROOT, Colorado Seed Co.

We have asked Leslie Paull to do this—Editor.

"Daffodils have large flowers with long trumpets and no fragrance. Jonquils have small flowers, several to a stem, a short tube and are fragrant. It is safer to call other types and hybrids simply Narcissus."

LESLIE PAULL.

DO YOU HAVE A GREEN THUMB?

If so you will be doing these things in May and June

You will attend at once to planting any new trees or shrubs needed before they are too far out in leaf.

You will carefully cover the roots of any plants, which must be moved, with wet burlap or some similar material.

You will move perennials with a large shovel of soil adhering.

You will not leave small annual plants lying around in the sun and wind.

You will carefully examine the soil that you put a plant in to see that it is in good physical condition and not full of objectional foreign material.

You will carefully water in any plant that you have moved, settling the soil by putting the hose down to the bottom of the hole.

You will not put rich fertilizer near the roots of a newly transplanted plant.

You will not burn leaves and weeds which might be made into good compost.

You will carefully cut back newly moved trees and shrubs, removing about one fourth of the existing growth.

You will be everlastingly on the watch for the first signs of damage by insects.

You will learn to distinguish between the damage done by sucking and chewing insects and spray accordingly.

You will first learn what sprays are proper, and when, and then spray whenever necessary.

You will not entirely uncover roses and other tender plants until settled weather has come.

You will not be fooled into thinking that spring is here after we have had a few warm days.

You will learn the peculiarities of Colorado climate and handle your plants accordingly.

You will not water your lawn too early so that it is induced to expect shallow moisture.

You will water your lawn and all plants thoroughly when you do water, but not too often.

You will cultivate in all the leaves and vegetable matter possible when you cultivate.

You will do most of your trimming of flowering shrubs just AFTER they bloom.

You will not trim off ALL the small branches and sprouts from shrubs so that they are left leggy and naked below.

You will learn to renew your old shrubs by taking out a fourth or so of the old stems each year.

You will start after the weeds as soon as they show up while they are easy to destroy.

You will not spade so deeply around shrubs and trees that you cut off many valuable roots.

You will be heartless about cutting back or removing rampant shrubs or trees which are crowding and disfiguring nicer plants.

You will thoroughly prepare the seed bed for new lawns, working under a good amount of fertilizer.

You will not attempt to plant a new lawn in "contractor's soil,"

that mixture of subsoil, bricks, plaster and rubbish so often found around a new house.

You will not blame the seed or fertilizer entirely for weeds found in your lawn. Usually they are in the soil.

You will look for scale insects on elm, dogwood, lilac, ash, cotton-easter, willow and aspen; and spray with a miscible oil if they are still dormant.

You will brush off small infestations of oystershell scale and knock off elm scale with a hard force of water from the hose just before the eggs hatch.

You will examine your dogwood, snowball and euonymus as soon as the leaves start to unfold, for signs of the aphid which winter over on these plants.

You will not plant tender annuals or seeds of tender plants until the ground is warm and the season settled.

You will thicken up weak spots on your old lawn so that weeds have no bare soil to start their seeds in. You will leave the catcher off the lawn mower as often as possible so that a good mulch of dead grass may accumulate. (But cut often enough so that the grass cuttings do not lie on top, making your lawn look like a hayfield).

You will shade newly transplanted plants for a while if they are inclined to wilt.

You will check up on spring bulbs needed, now, while it is fresh in mind.

You will trim hedges which were not taken care of the last thing last fall.

You will clean out the pool and repair it if necessary.

You will watch for the galls on spruce trees and pull them off while they are still green and full of aphid. (And next year you will spray them just before the buds "break" with lime-sulphur).

You will not be so foolishly neat that you rake off the duff from under trees and shrubs.

You will not judge the value of your tree trim job by the quantity of brush cut off.

You will know that eliminating stubs and protecting decayed spots is sometimes the most important "trimming" needed.

You will not take as gospel ALL the things that eastern writers tell you about your garden work.

You will read good horticultural books and magazines and learn to discard those things which do not apply to Colorado.

You will occasionally try some "impossible" plant and report your success (or failure).

You will check over your trees for broken branches, rubbing limbs and duplicate limbs which should be removed.

You will consult local authorities when horticultural problems come up which seem to be peculiar to Colorado.

You will pass on to your neighbor valuable horticultural hints that you have learned.

You will tell your neighbors of the work that the Forestry and Horticulture Association is doing to make Colorado a better and more beautiful state.

When you have done (or not done) all of these things you can rightfully expect at least a faint tinge of green on your thumb.

ARE WE WORTHY OF YOUR SUPPORT?



As with most organizations, a small group of people do the majority of the necessary work. Many of our members, especially the new ones, do not have clear in their minds just what we are doing, and what our objectives really are,

It seems to me, that we have two general objectives. First, to supply detailed information to gardeners and those interested in horticulture on horticultural practices and plants adapted to our peculiar Colorado climate. This should be of direct benefit to every resident of the state who attempts to grow flowers, lawns, vegetables or trees.

Second, we should be a source of inspiration for those who are interested in making our state more beautiful and livable.

We should boost for more, better and more appropriate trees; for the preservation of our many natural beauty spots; for the planting of barren places and the development of horticulture in all its phases.

To give the membership a better idea of what the directors, officers and committees are doing we give in this issue condensed reports of some of the committees which were read at the annual meeting, February 15-16, 1946.

As an organization we will not attempt to do everything that

should be done, but encourage and point the way for individuals and organizations all over the state to do the things needed which are nearest them; to plant more trees, to preserve beauty spots, to better landscape their homes, and to encourage research to develop new and better plants and practices.

The organization needs the support of every lover of their state and every lover of growing things, wild or cultivated. Tell your friends and neighbors of the work we are doing and help improve the status of horticulture in Colorado. No one is making a profit from the organization, but many are donating much valuable time and money to help the work. The dollar membership does not even cover the cost of publishing the Green Thumb.

Each member can also help by sending in pictures and descriptions of good plantings, unusual plants, especially beautiful spots and places needing beautification.

Some of our most enthusiastic members have stated that if we can line up a sufficient number of the people in the state who should be interested, that this organization can be one of the greatest factors for the improvement of Colorado that has ever existed.

GEORGE W. KELLY



**FLOWERS and GARDENS of the
CENTRAL CITY REGION**

50¢

The Green Thumb

CENTRAL CITY TERRACES

BY MURIEL V. SIBELL

Tier upon tier the streets of Central City perch on the mountain sides, some close to the mines and some leading to the heart of town, close to the Opera House, the Teller House, and the Masonic Lodge. Houses with new coats of paint stand next to decaying structures with a past. Wander past foundations which once held stamp mills, whose deafening noise was a welcome sound in boom days. Or pick your way carefully at night over broken wooden sidewalks, your footsteps unnaturally loud as they echo against empty plaster walls and brick ruins of stores and saloons.

Walk the streets today, but live in the city's past. Then you will thrill to its houses, which are rattling shells of gentility, with lacelike ornament on the porches and Gothic windows in the gables. Climb the narrow, musty stairs to the newspaper office where a veteran editor once typed editorials amidst papers and books, the accumulation of years.

Soon you will not see the bleached wood and broken shutters, the peeling plaster and the festoons of wallpaper fluttering from ceilings as a stiff mountain breeze whistles through the eaves; but you will see, instead, the ambitions and undying faith of the people who built this community and whose descendants will tell you that "It's not a ghost town. It will come back." And you will believe them because they believe themselves.

THE GREEN THUMB

A Bulletin of the

COLORADO FORESTRY AND HORTICULTURE ASSN.

Organized in 1884

George W. Kelly, Editor

James S. Holme, Associate Editor for this issue

L. C. Shoemaker, Office Manager

Room 17, 1608 Broadway — Phone TAbor 3410

Hours: 11 to 2 — Monday, Wednesday and Friday

"To preserve the natural beauty of Colorado; to protect the forests; to encourage proper maintenance and additional planting of trees, shrubs and gardens; to make available correct information regarding forestry, horticultural practices and plants best suited to the climate; and to coordinate the knowledge and experience of foresters, horticulturists and gardeners for their mutual benefit."

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Life memberships \$25.00

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The Special Central City Issue

The Colorado Forestry and Horticulture Association has assembled here for the pleasure and information of visitors to Central City, descriptions and illustrations of plant life found in the area. Four leading authorities on horticulture in the state have cooperated in the preparation of this material. They have each presented a different phase of the subject.

1. The native vegetation as it was before the coming of the miners.
2. The evolution of the interest in gardens, trees, and lawns, as the community grew and matured.
3. The Opera House garden. Early attempts and present design.
4. The possibilities for developing and preserving natural beauties in this and other similar communities.

The wide range of altitudes and soils in Colorado makes the area one of special interest horticulturally. The native varieties of beautiful and rare trees, plants and flowers are innumerable. Through the planned use of local plant material, there are great, though as yet mostly unrecognized, possibilities for groups of interested citizens, at small cost, to beautify and make more livable their communities.

The Colorado Forestry and Horticulture Association was organized to encourage the development and preservation of horticultural values throughout the state, and makes available correct information on native plants and their uses. The Association hopes that every visitor to Central City will enjoy this handbook of plant material of that area.

GLADYS C. EVANS,
(Mrs. John Evans)
President.



COLORADO COLUMBINE

Drawing By O. R. Maxson

BEFORE THE CRY OF "GOLD"

MARK AND CLAIRE NORTON

The Original Plant Life of the Central City Hills

The sun slipped down from trembling leaf to leaf and touched lightly the Blue Columbine swaying in the breeze against the white trunk of the Aspen. It passed on, down the slope, and briefly found out white-flowered Dotted Saxifrage and Fragile Fern clinging to the side of a rocky outcrop. It lighted up, in passing, the heavy green mats of Kinnikinnick with fairy washing hung out to dry among shining green leaves. It peeped shyly through the soft dark green branches of Douglas Fir and the stiff bluish-green of Spruce to rest for a moment on the forest duff among a colony of pink-flowered Pyrola.

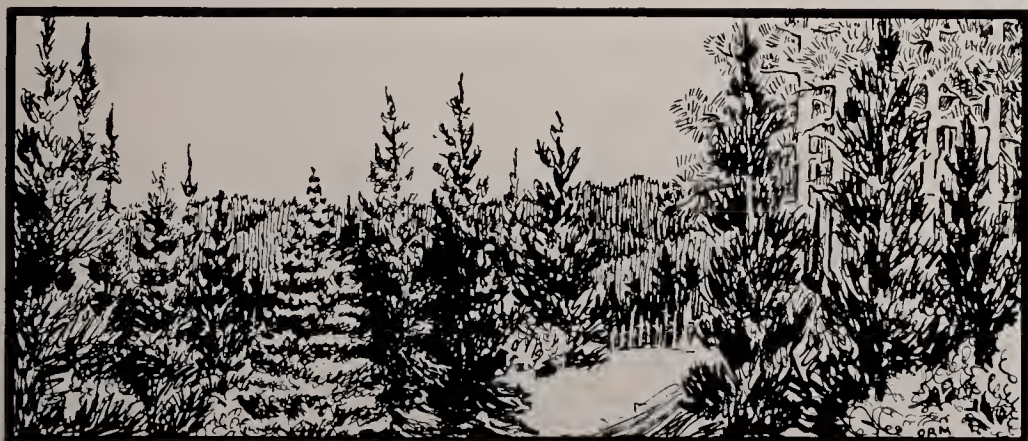
It skimmed gaily along the tumbling clear stream, making rainbows of the splashing drops, and on a grassy knoll paused to admire its own glory reflected from the upturned cup of the Wood Lily. Then hurrying on and on upstream, past Little Red Elephants and Blue-Eyed Grass and Shooting Stars making beauty of the marshy hummocks, to an open meadow where sun and wind together danced a minuet among the swinging Bluebells.

For it was summer. The summer before the cry of "Gold!" had echoed back and forth from hill to hill, and in this great amphitheater of the Rockies a world lay waiting its des-

tiny. To the future belonged the names of Gregory Diggings, of Eureka Gulch, of Central City. Now Nature—the sun, the wind, the stars, the rain, were supreme. Paintbrush and Sulphur Flower, Wild Rose and Mountain Spray, Foxtail Pine and Narrow-leaf Cottonwood all hastened to perfect their pattern of bloom and ripening seed, the age-old pattern of adding generation to generation to insure the future.

This same sun of the summer season had valiantly pushed back the snows of winter to warm the beaten gray grass of the hillsides again to life-giving green. It had swelled the buds of Aspen and Cottonwood, of Rocky Mountain Maple and of Willow to lay a misty green mantle over the slopes against the darker green of the Conifers. It had awakened the Mountain Alder and Birch along the stream. It had stood by to encourage the first Easter Daisy to open its white, pink-tinged flower. It had called forth the dancing Buttercups, the Erigerons, the Snow Saxifrage, and gently whispered to the gray-green rosettes of Lesquerella that spring had come.

It stroked the pussy-furred buds of Pasque Flower into open lavender cups to make a glory of every open nook and cranny. It brought the sap up in the Rock Pine and the Cedar to form



their cones, the one so large, the other a mere berry. It told the Lodgepole Pine it was time to put on girth and to set out new cones among its old.

As it climbed ever higher in the sky, it brought to the Mountain Mahogany the most inconspicuous of blossoms; to the Western Thimbleberry, a large and beautiful rose-like bloom of purest white; to the Low Ninebark and New Jersey Tea, sprays of white flowers; to the Jamesia, a waxen white bloom. It settled a crown of bright pink on the Pincushion Cactus and gave to the Holly Grape a yellow bouquet. It hung hairy, deep purple-blue bells on the Bush Clematis, and dainty pink buds and fragile bells of sky blue on Mertensias.

In a shaded deep ravine, where a Douglas Fir lay prone, the late spring sun sought and found the dainty Fairy Slipper Orchid. It gently caressed the rounded leaves of the trailing Linnaea, whose twin perfect bells it would find again later in the season. It lingered among the tender new growth of Elderberry, of Involucred Honey-suckle, and stroked the scaly bark of the Canada Buffalo Berry branches.

Out of the earth the sun of spring brought forth the summer and autumn blooming plants of these hillsides, meadows and ravines. There came at its call the blue and the pink flowered Pentstemons in wide variety, the Golden Banner, the Mariposa Lily, the Twisted Stalk and False Solomon's Seal, Violets blue and white and yel-

low, Lady's Bedstraw and Anemones, Miner's Candle, Fireweed, big Green Gentian, little Love Gentian, and the blue, blue Gentians of autumn, Jacob's Ladder, huge Cow Parsnip of the streamside, Pretty Puccoon, forget-me-not blue Stickseed, Prickly Cactus, Dandelions, Senecios, Machaerantheras, Erigerons and Asters by the dozens of kinds and species. All of these, and more, came to fill the amphitheater where one day Central City would hold the stage, where men brave and strong and men weak of will would foregather at the cry of "Gold!" to find fortune, to settle and build homes, to know heartbreak and pass on, but each to leave the imprint of his footsteps on rocky slope, on grassy meadow, beside stream and on wooded hillside.

But now only the sun of summer looked with favor on Columbine against Aspen trunks. It struck a glow from the golden-flowered Arnica, danced among the leaves of Meadow-rue, lit up the white plume of the Baneberry flower, touched the Wand Lily, held for a moment the silken-texture of the petals of Virgin's Bower. Out on the hot grassy slope it flashed from the magenta flowered Lambert's Loco to the tall waving wands of the Fairy Trumpet Gilia, and became entangled in the gray mats of Kitten Toes in a gravelly nook. It gave added fire to the brilliant Paintbrush and the Gaillardia, and gradually turned the whole color scheme to yellow with



RIGHT, PONDEROSA PINE

Photo by Stewarts,
Colorado Springs



the dominance of Sunflower, Goldenrod, Hawksbeard and Senecio, with here and there a touch of blue and white from late blooming Asters and Erigerons and Machaerantheras.

So the sun of summer changed to the sun of autumn, with days growing shorter, nights of frosty cold, and the sun itself reflected from the golden and orange leaves of the Aspens, the gold and red of the Maple, the Elder, the Wild Rose, the Chokecherry, the Jamesia. Deep in shaded spots the Baneberry carried aloft its waxen red berries, beautiful in modeling but not for eating. The Honeysuckle set out twin black berries in deep red involucre. Under the sun the fleshy berries of Wild Raspberry and the seedy berries of Thimbleberry alike ripened and dropped to the ground. Rose hips of brilliant hue nodded in the fall

breeze, and the Holly Grape exchanged its yellow bouquet for clusters of grape-like fruits. Mountain Mahogany became a plumed knight. And over the marshy hummocks and the meadow spread a blue mantle of Gentians.

Thus ended the season of growth, of bloom, of fruit. Golden Aspen leaves dropped down to blanket the Columbine, the Meadowrue, the Golden Banner; the sun shone on bare branches. The Pines, the Spruce, the Cedars drew into themselves, and each a little closer to its neighbor, for they alone seemed to hold a vestige of life. Snow covered the Paintbrush and the Loco, the Bluebells and the Shooting Stars. This little world high in the Rockies was almost done with waiting—waiting for the coming of the miner with his cry of "Gold!"

BELOW, DOUGLAS FIR



Conspicuous Plants to Look For in the Central City Area

LIST COMPILED BY MARK AND
CLAIRE NORTON

Names used here by the authors are those with which most Colorado botanists are familiar. Names in parentheses are those recommended by "Standardized Plant Names."—Editor.

TREES

Bristlecone Pine (Foxtail Pine)

Pinus aristata

Limber Pine

Pinus flexilis

Western Yellow Pine (Ponderosa Pine)

Pinus ponderosa

Lodgepole Pine

Pinus contorta var. *latifolia*

Blue Spruce, Silver Spruce (Colorado Spruce)

Picea pungens

Englemann Spruce

Picea engelmanni

(Common) Douglasfir

Pseudotsuga taxifolia

Rocky Mountain Juniper

Juniperus scopulorum

Dwarf Juniper (Common Juniper)

Juniperus communis var. *montana*

Narrowleaf Cottonwood (Poplar)

Populus angustifolia

(Quaking) Aspen

Populus tremuloides

SHRUBS

Rocky Mountain Birch (Water Birch)

Betula fontinalis

Mountain Alder (Thinleaf Alder)

Alnus tenuifolia

Willows

Salix spp.

Common Shad (Dwarf Serviceberry)

Amelanchier spicata

Western Chokecherry

Prunus melanocarpa (*P. virginiana* demissa)

A. ROCKY MOUNTAIN JUNIPER

B. MOUNTAIN COMMON JUNIPER



(From *Colorado Evergreens*, by
Robert E. More)



ROCKY MOUNTAIN BIRCH

Courtesy University of Colorado



ROCKY MOUNTAIN ALDER

Courtesy University of Colorado

- Rocky Mountain Maple
Acer glabrum
- Red Currant, Squaw Currant (Wax Currant)
Ribes cereum
- (True) Mountain Mahogany
Cercocarpus parvifolius (*C. montanus*)
- Mountain Spray (Bush Rockspirea)
Holodiscus dumosus
- Western Thimbleberry (Boulder Raspberry)
Bossekia deliciosa (*Rubus deliciosa*)
- (Redosier) Dogwood
Cornus stolonifera
- Involucred (Bearberry) Honeysuckle
Lonicera involucrata
- Elderberry (Bunchberry Elder)
Sambucus microbotrys
- Yucca (Small Soapweed)
Yucca glauca
- Gooseberry
Ribes spp.
- (Cliff) Jamesia
Jamesia americana
- Low Ninebark (Mountain Ninebark)
Physocarpus monogynus
- Shrubby (Bush) Cinquefoil
Dasiphora fruticosa (*Potentilla fruticosa*)
- Wild Rose
Rosa spp.
- New Jersey Tea (Fendler Ceanothus)
Ceanothus fendleri
- Canada (Russet) Buffaloberry
Shepherdia canadensis
- Snowberry
Symphoricarpos spp.
- Sagebrush
Artemisia spp.
- Rabbitbrush
Chrysothamnus spp.
- Holly Grape (Creeping Mahonia)
Mahonia repens
- Kinnikinnick (Bearberry)
Arctostaphylos uva ursi
- Bilberry
Vaccinium spp.
- Prickly Pear (Cactus)
Opuntia spp.
- Pincushion Cactus
Echinocactus simsoni
- Fragile Fern (Brittle Bladderfern)
Filix fragilis (*Cystopteris fragilis*)
- Woodsia
Woodsia spp.
- Selaginella
Selaginella spp.

FLOWERS

- (American) Twin Flower
Linnaea americana
- (Prairie) Spiderwort
Tradescantia occidentalis
- Sand Lily (Common Starlily)
Leucocrinum montanum
- Wild Onion
Allium spp.
- Wood Lily
Lilium montanum (*L. philadelphicum*)
- Mariposa Lily (Gunnison Mariposa)
Calochortus gunnisoni
- Wand Lily
Zygadenus elegans
- (Claspleaf) Twistedstalk
Streptopus amplexifolius
- False Solomon's Seal (Solomonplume)
Smilacina spp.
- (Rocky Mountain) Iris
Iris missouriensis
- (Common) Blue-eyed Grass
Sisyrinchium angustifolium
- Fairy Slipper (Calypso)
Calypso bulbosa
- Green Orchis
Limnorchis spp. (*Habenaria* spp.)
- Sulphur Flower (Sulphur Erigonum)
Eriogonum umbellatum
- Spring Beauty
Claytonia rosea
- Starwort
Stellaria spp.
- Chickweed (*Cerastium*)
Cerastium spp.
- (Fendler) Sandwort
Arenaria fendleri
- (Western) Baneberry
Actaea arguta
- Colorado Columbine
Aquilegia coerulea
- Larkspur
Delphinium spp.
- (Columbia) Monkshood
Aconitum columbianum
- Windflower (Pacific Anemone)
Anemone globosa
- Canada Anemone (Meadow Anemone)
Anemone canadensis
- (American) Pasqueflower
Pulsatilla hirsutissima (*Anemone ludoviciana*)
- (Douglas) Bush Clematis
Clematis douglasi



ROCKY MOUNTAIN MAPLE

THIMBLEBERRY



MOUNTAIN MAHOGANY,
from *Meet the Natives*



BANEERRY



ABOVE—KINNIKINNICK

BELOW—SPRING BEAUTY



- (Western) Virginsbower
- Clematis occidentalis* (*C. ligusticifolia*)
- Buttercup
- Ranunculus* spp.
- Meadowrue
- Thalictrum* spp.
- Prickly Poppy (Pricklepoppy)
- Argemone intermedia*
- Golden Smoke (Golden corydalis)
- Corydalis aurea*
- Candytuft (Blue Pennycress)
- Thlaspi coloradense* (*T. glaucum*)
- Bittercress (Heartleaf Bittercress)
- Cardamine cordifolia*
- Bladder Pod
- Physaria* and *Lesquerella*
- Draba*
- Draba* spp.
- Western Wallflower (Plains Erysimum)
- Erysimum asperum*
- Colorado Beeplant (Bee Spiderflower)
- Cleome serrulata*
- Stonecrop (Wormleaf Stonecrop)
- Sedum stenopetalum*
- Alumroot
- Heuchera* spp.
- Dotted Saxifrage (Yellowdot Saxifrage)
- Saxifraga austromontana*
- Snow Saxifrage (Diamondleaf Saxifrage)
- Saxifraga rhomboidea*
- Strawberry
- Fragaria* spp.
- Cinquefoil
- Potentilla* spp.
- Pink Plumes (Prairiesmoke Sieversia)
- Sieversia ciliata*
- Golden Banner (Thermopsis)
- Thermopsis* spp.
- Lupine
- Lupinus* spp.
- Loco
- Aragallus* spp. (*Astragalus* spp.)
- Cranesbill (Geranium)
- Geranium* spp.
- Storkbill (*Alfileria*)
- Erodium cicutarium*
- (Lewis) Flax
- Linum lewisi*
- Violets
- Viola* spp.

Photos from *Meet the Natives*

Fireweed

Chamaenerion angustifolium (*Epilobium angustifolium*)

White (Tufted) Evening Primrose

Pachylophus macroglottis (*Oenothera caespitosa*)

(Common) Cow Parsnip

Heracleum lanatum

Wintergreen (*Pyrola*)

Pyrola spp.

Shooting Star (Darkthroat Shootingstar)

Dodecatheon pauciflorum

Rocky Mountain Fringed Gentian

Gentiana elegans (*G. thermalis*)

Perennial Fringed Gentian

Gentiana barbellata

Love Gentian (New World Annual Gentian)

Gentiana plebeja (*G. plebeia*)

Green Gentian (Rocky Mountain Swertia)

Swertia radiata (*S. scopulina*)

Phlox

Phlox spp.

Gilia

Gilia spp.

Fairy Trumpets (Skyrocket Gilia)

Gilia aggregata

Jacob's Ladder (*Polemonium*)

Polemonium spp.

Waterleaf

Hydrophyllum spp.

Phacelia

Phacelia spp.

Miner's Candle (*Cryptantha*)

Oreocarya virgata (*Cryptantha* spp.)

Bluebells

Mertensia spp.

Puccoon (Gromwell)

Lithospermum spp.

Horsemint (Mintleaf Beebalm)

Monarda menthaefolia

(*Penstemon*) Beardtongue

Penstemon spp.

Lousewort (*Pedicularis*)

Pedicularis spp.

Little Red Elephants (*Elephantella pedicularis*)

Elephantella groenlandica (*Pedicularis groenlandica*)

Paintbrush (Paintedcup)

Castilleja spp.

Lady's Bedstraw (Northern Bedstraw)

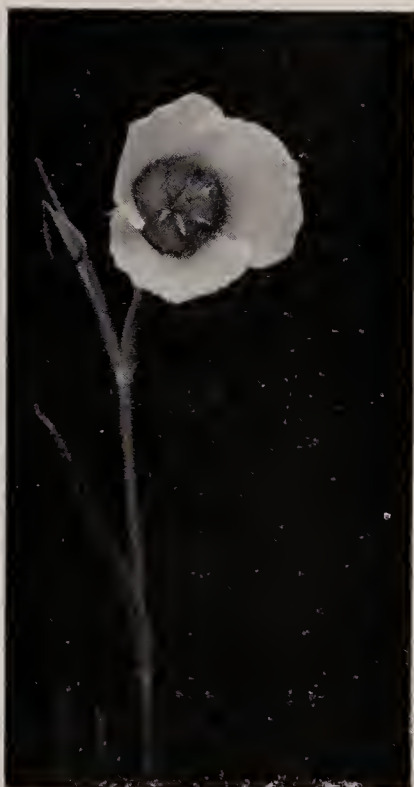
Galium boreale

Harebell (Bluebells)

Campanula rotundifolia



SNOWBALL SAXIFRAGE



ABOVE—MARIPOSA

BELOW—CANADA VIOLET



Photos from *Meet the Natives*



Photo from *Meet the Natives*

WOOD LILY

- | | |
|------------------------------------|-------------------------------|
| Valerian | Kitten Toes (Pussytoes) |
| Valeriana spp. | Antennaria spp. |
| Gum Plant (Gumweed) | Blackeyedsusan |
| Grindelia spp. | Rudbeckia hirta |
| Golden Aster (Goldaster) | Sunflower |
| Chrysopsis spp. | Helianthus and Helianthella |
| Actinella (Actinea) | (Common Perennial) Gaillardia |
| Actinella spp. (Actinea spp.) | Gaillardia aristata |
| Goldenrod | (Common) Yarrow |
| Solidago spp. | Achillea millefolium |
| Easter Daisy (Stemless Townsendia) | Arnica (Heartleaf Arnica) |
| Townsendia exscapa | Arnica cordifolia |
| Aster | Senecio (Groundsel) |
| Aster spp. | Senecio spp. |
| Erigeron, Daisy (Fleabane) | |
| Erigeron spp. | |



QUAKING ASPEN IN WINTER

CENTRAL CITY GARDENS

BY PRUDENCE BOSTWICK

People who built Central City came primarily for the chance to make a fortune from its fabulous mines. Their first log cabins, put up in the early sixties, were merely shelters from the wind and rain and from the winter cold. Later, as the community became more stable and graceful houses began to take the place of temporary shacks and cabins, men built, tier on tier, the retaining walls which held back the soil and which gave to the city that stability and security which impress the visitor even today.

But where the activities of men had destroyed the natural covering of the soil, the land was bare, and early visitors to Central City remarked on the "hideousness" of the immediate surroundings.† However, no matter how offensive to the eye the barren and broken soil around the houses, lawns and gardens were impossible to grow because of the shortage of water. In

the early days, water was obtained from springs and wells which were owned by individuals. Harry H. Lake, son of Central City pioneers, tells of how in those days his mother used to use a sprinkling can filled with water from her well to keep alive a row of sweet peas. A few hardy families, accustomed to the luxuriant green of the East, tried to grow lawns, but such projects were so expensive in both water and energy that they were given up. The Teller family, whose house stood on the present site of the Court House, partially solved the problem by using native bunch grass from the surrounding hillsides as a ground cover. As no attempt was made to cut it, the grass grew tall and luxuriant around the house.

†Perrigo, Lynn Erwin. A SOCIAL HISTORY OF CENTRAL CITY, COLORADO. 1859-1900. Ph.D. Thesis, University of Colorado, 1936, p. 108.



GARDEN OF MRS. JOHN FULLER, CENTRAL CITY

As the mining activities became more extensive, however, the local springs and wells gave out; and water for domestic purposes was peddled from house to house at seventy-five and later at fifty cents a barrel. If anyone hoped for cultivated plants, he had to depend on sporadic rain or, in time of drought, on whatever water could be carried in a sprinkling can.

Trees had already been brought into the town in the very early days. The settlers, not content with the scrubby little aspens (*Populus tremuloides*) which were native to the ravines of Central City, went to the Fall River country and from a distance of four or five miles carried in by hand seedlings of the narrow-leaf cottonwood (*Populus angustifolia*) which grows along the creek beds in that region. These trees have done well in Central City. Some broad-leaf cottonwoods (*Populus Sargentii*) were brought up from the plains region where they are native. These too have prospered. It is interesting to note what little use was made of the native evergreens as ornament or ground cover.

Two shrubs, by far the most famous of the plant life of Central City, were introduced during these early years. The Harison yellow roses, which have "taken" all the crevices and garden edges of the town and which hang in yellow splendor over the retaining walls in early summer, are offspring of a single bush planted in the early sixties by the family of Henry M. Teller, builder of the Teller House, who later became United States Senator from Colorado. No one knows the place from which this first Harison rose was brought. Some say Texas; others, the Middle West. The lilacs, which have also spread over the town, were first imported and planted in 1875 by Abraham Rachofsky, a Gilpin County pioneer, beside the small green and white house to which he took his young wife, Etta Cohen. This house,

built between the Methodist Church and the Court House, is still standing. Here the lilacs flourished and grew so luxuriantly that for many years they were recognized as one of the "sights" of the scarred and barren little town.

Because of the scarcity of water, many women grew plants indoors. An item in the *Central City Weekly Register-Call* in 1881 mentions the large collection of house plants at the residence of Mrs. Henry Bolthoff on High Street and boasts of her oleander "which for beauty could not be excelled in the state." A photograph of the Teller House conservatory, which was housed in the upper balconies of the court, shows a collection of geraniums, rubber plants, ivy, wandering Jew, and other rather common plants, along with tubs of oleanders.

It was not until the water mains of the city were completed in 1886 that any serious attempts were made to have gardens and lawns. By that time the characteristic buildings of the city that mark its cultural growth were already standing: the school house (1870), St. James Methodist Church (1872), the Teller House (1872), St. Paul's Episcopal Church (1873), and the Opera House (1878). By that time, too, whatever top soil may have been available for the nourishing of garden plants had, long ago, been washed down the steep hillsides. Not even the retaining walls could hold the thin layer of loam which came from what little native growth was left. Accordingly, any gardeners in Central City were faced with the necessity of bringing in rich soil from the edges of the creeks or from the floor of aspen forests where the richest humus can be found. This meant that gardening in Central City was still a problem demanding an expenditure of time and energy and real devotion.

In spite of the trouble and care, lawns began to appear, shrubs were



LOOKING DOWN ON CENTRA



TY FROM THE HIGH ROAD

extensively planted, especially yellow roses, lilacs, and honeysuckle, and gardens were edged in iris, pansies, cosmos, sweet peas, nasturtiums, poppies, and native columbines.

Although the end of the old century and the beginning of the new saw a slowing up in the production of the mines and an extensive exodus of the people from the whole of Gilpin County to the cities of the plains, especially Denver, there still remained in Central City enough families to keep alive some of the tradition of cosmopolitan living and to keep many of the gardens that had been made possible through the city water supply. Once in a while there came to the town people who stirred anew the sense of destiny that had once characterized the community. Such were the Henry Lowes, who went to Central City from Denver in 1909 to make their home. They brought with them certain traditions of elegance which were expressed in many ways, but especially in the creation of a garden which was designed by a professional landscape gardener. The soil, brought in from the creek beds, was held in place by retaining walls. The garden was laid out with summer house, surrounding walls, and fence, and small paths between the beds where iris, peonies, delphinium, golden glow, dahlias, phlox, gladioli, and similar plants grew. Of romantic interest are the twelve rare hybrid roses which flourished in this garden thirty-seven years ago. They were brought by Mrs. Lowe from her garden in Denver in spite of the warnings of her friends that hybrid roses would not do well in Central City. Contrary to all expectations, they lived and blossomed the first summer. It was well that they did, for they were Luxembourg hybrid roses that had been sent from Paris as a special gift to the Lowes by Alexis Brasseur, the greatest French criminal lawyer of his time, in appreciation of

his days in Denver as their guest.

Several years later the Lowes moved across the street from their first home in Central City. Here Mrs. Lowe still lives, and here she has fashioned a little "English" garden which lies between the rear wall of her house and a wall about nine feet distant which keeps back the flood waters of the flume. Upon a base of rock and sand, rich, black earth was filled in to a depth of several feet. In this small area, about nine by fifteen feet, Mrs. Lowe has developed one of the loveliest gardens in Central City. Here grow spring bulbs—tulips, narcissus, and daffodils; iris; and violets. As summer comes, the oriental poppies bloom, along with pansies, violas, regal lilies, delphinium, and Iceland poppies. In early summer the Cecil Brunner roses are especially fine. Golden glow, lace vine, calendulas, and other fall flowers flourish until frost. The photograph shows how well Mrs. Lowe has used bird bath and trellis in so small a space. When one asks Mrs. Lowe how she knows which flowers do well in the eight-thousand-five-hundred foot elevation of the town, she answers that one knows only by experimenting over the years.

Another experimentalist in the field of growing gardens in Central City is Mrs. Harry H. Lake, who has been able to maintain a rose garden by setting out two-year-old plants each year during the latter part of May. These bloom luxuriantly, in a well-fertilized loam, during the summer, especially if the nights are not too cool. In winter the plants usually die from the cold and drought of the high altitude, and in the spring new plants must be set out again.

More recently, with the rebirth of Central City through the summer festivals of the Opera House Association, the gardens of the town are showing new life. As many of the houses are

RIGHT, GARDEN OF MRS. HENRY P. LOWE

Photo by S. S. Newbury



once again claimed by the descendants of their original owners or are purchased by enthusiasts new to the region, attention is given not only to refurbishing the dwellings, but also to the development of lawns and gardens. Rock work, so well begun by the pioneers eighty years ago, continues to serve in the cause of holding the soil and in dealing with the difficult nature of the terrain.

Two gardens show particularly well this imaginative treatment in which the natural beauty of slope and occasional outcroppings of lichenized granite are utilized in the design. One of these is that planned and developed by Mrs. James Macfarlane for her house on Eureka Street which she has recently sold to Mr. and Mrs. Bert Shobert. Here a green lawn, edged on three sides by perennial flower beds, runs to the base of a rocky hillside where soil is held by a low retaining wall to form a flower bed. Here plants bloom against the background of natural rock. Mrs. Macfarlane, working with a rich soil of peat moss and leaf mold, has managed to utilize in the most pleasing ways both the flowers of the hills and ravines and those introduced from cultivation. Pentstemon, Lupine, bluebell, and columbine bloom with iris, violas, pansies, sweet William, oriental poppies, delphinium, nicotiana, phlox, and peonies. Ground cover of periwinkle and sedum is abundantly used. In the beds held by retaining walls and in the crevices of the rocks above are yellow and pink stone crop, shrubby cinquefoil, moss pink, and saxifrage. Everywhere native shrubs and evergreens are encouraged to grow along the rocky hillside that forms the backdrop for house and garden.

The second garden is located far up the steep road which leads to the Free-

dom dump. It was laid out by May Martin, who has since sold the house and grounds to an enthusiastic family of Evanston, Illinois. Here again extensive use is made of rock terracing which rises in five or six wide tiers behind the house and up the hillside to a road which follows where a small tram used to haul ore from the mine to the mills. A watering system enables the gardener to care for the entire area with ease. Here are lupine, columbine, phlox, iris, tulips, pansies, larkspur, hollyhocks, raspberry, rosemary, and mint.

These are but two of the many gardens which bloom in Central City. Newcomers and natives alike continue to struggle against poor soil, steep slopes, and winter winds to provide that sense of permanency and good living which come with lawns and summer flowers. Keeping the tradition for all the people of Central City is Harley Berkey, custodian of the Court House of Gilpin County. Here he tends a municipal garden where anyone who wishes may walk and stop as often as he likes to admire the blossoms which flourish in the warm sun and cool nights of the mountain country. Sweet peas, bleeding heart, nasturtiums, bachelor's-buttons, and oriental poppies grow there. And in the late summer there are gladiolas and dahlias to lend their color to the capitol of the Kingdom of Gilpin.

For the material contained in this article the writer is indebted to Mr. and Mrs. Harry H. Lake, of Central City and Denver; Mrs. Walter E. Scott, Jr., of Central City; Miss Ina Aulls, Chief, and Mrs. Alyf Freeze, Assistant, Western History Department of the Denver Public Library; Mrs. John Fuller, of Central City; and Mrs. Henry P. Lowe, of Central City, who gave not only of her time and energy in interview but also provided and allowed free use of the photograph of her Central City garden which is reproduced here.

THE OPERA HOUSE GARDEN

BY KATHLEEN MARRIAGE

When those Cornish miners built this Opera House in 1878 we wonder what they planted in the surrounding grounds? Did they suggest to Tom from Trebarfoot and to Larry from Launceston that when they'd set out next year for the U. S. A. they bring with them beeches, oaks and firs from the groves on the Cornish tors, polypody ferns from the Camelford roadsides and daffodil bulbs from the Lanlake streamside?

However beautiful they made the grounds, the lapse during "ghost town" times brought an era of neglect in which any original planting died, dead as Queen Anne; so when the new Opera House committee took over, the occupants of this garden were chiefly dumps and rubble, tin cans and old bottles.

Miss Anne Evans, co-ordinator of the Opera House revival, realized that

however attractive the interior of the Opera House the grounds were nothing to be proud of. So, a week or so before the first grand opening, she interested two men in improving this area. These two "builders of beauty" had energy to add to their discrimination. Up they went to Central City, set to work and soon all the lower area near the street level was cleared of unsightly debris. Now what to mitigate the startling bareness? It was mid-summer so no tree planting was possible. They interested the local Forest Service who gave them a truck load of cut pine trees. These were fastened to Christmas tree stands, then the stands buried. Overnight here was a grove of evergreens that did wonders to improve appearances during that summer's Opera season.

Next year what to do? Operatic producers and their assistants don't

"A GROVE OF EVERGREENS OVERNIGHT"

Photo by M. Walter Pesman



concern themselves with any scenery except such staging as may be painted, erected and removed at will so the committee bumped up against another Opera season with ground still bare. Again these same two men buckled to, and transplanted from a "sample house" on display in Denver shrubs and trees left when the house was removed—Spruces, lilacs, spireas and other shrubs in full leaf. Their thumbs were right color for everything survived and once again the grounds were presentable. The two energetic friends in need? Mr. George Kelly and Mr. Walter Pesman.

The Garden Club of Denver, reflecting the glory of the Garden Club of America in its public spirit, took it over as their job to provide a long range plan for the whole garden—hillside included—and to plant towards this plan each spring.

The first such planting was begun at the street level working back towards the rugged steep hillside. Spruces by the high blank walls serve as a background for gay flowers, such

sturdy fellows as: Anchusas dropmore and Barrelieri, Iceland Poppies with their numerous progeny. *Centaurea macrocephala*, Rocky Mountain Blue Columbine, *Anthemis tinctoria*, *Campanula glomerata* and *Achillea Cloth of Gold*.

On this rocky hillside and at this altitude, 8,500 feet above sea level, only the hardiest things are worth planting. By the steps which lead up the hillside are sedums, linarias, pentstemons and such others as will hang on by their eyebrows.

When, more or less breathless, we arrive at the top step we are rewarded by the welcome sight of a seat of rough stone amidst a group of Foxtail Pines, with a level paved area, a little retreat built in memory of Miss Anne Evans.

In anticipation of the reopening of the Opera House after war's hiatus more of the plan has been carried out. The planting was continued this spring with Foxtail Pines on the hillsides and spruces on the lower level, under the enthusiastic sponsorship of the Garden Club of Denver.

THE 1934 PLANTING, OPERA HOUSE GARDEN

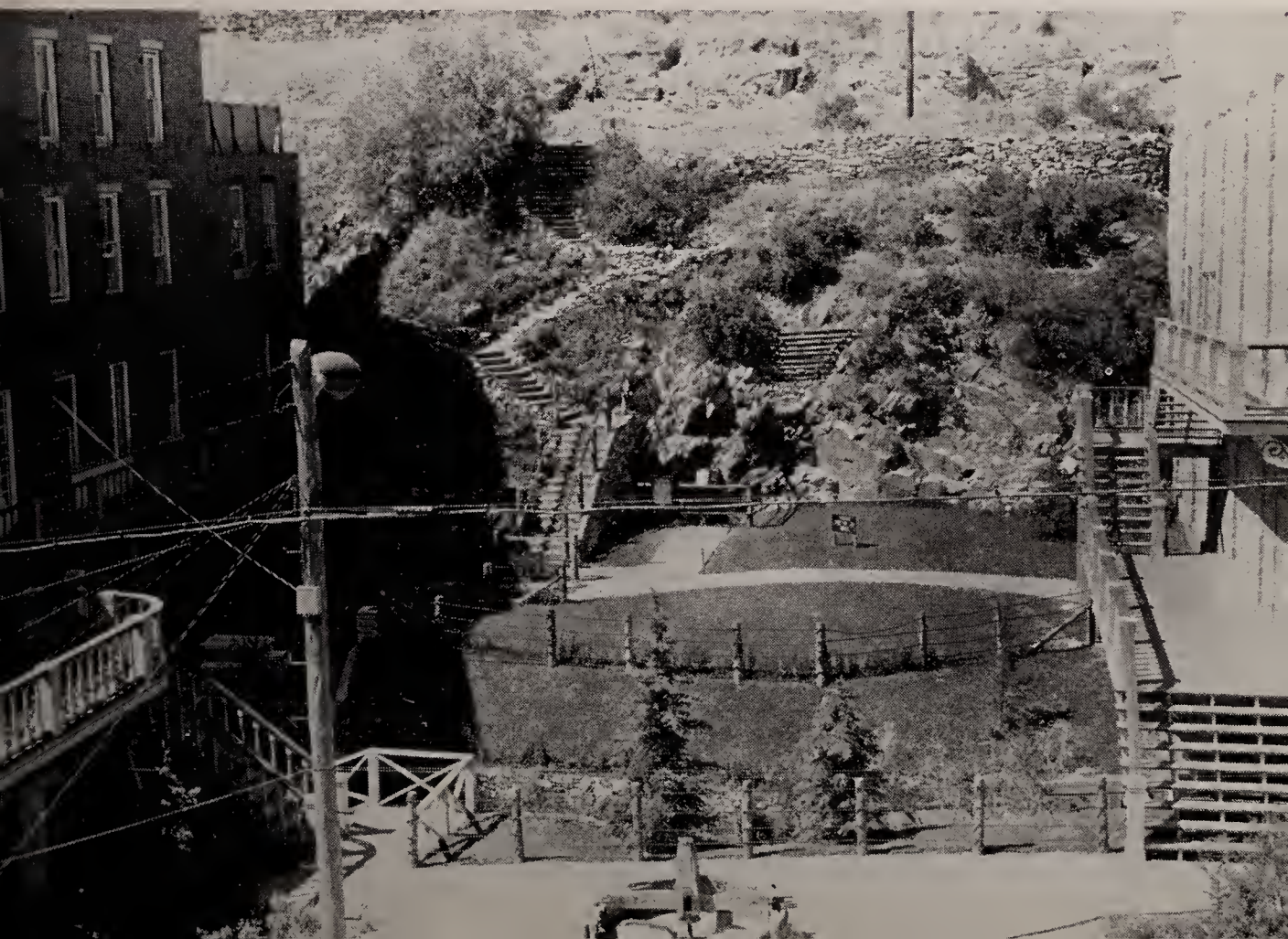


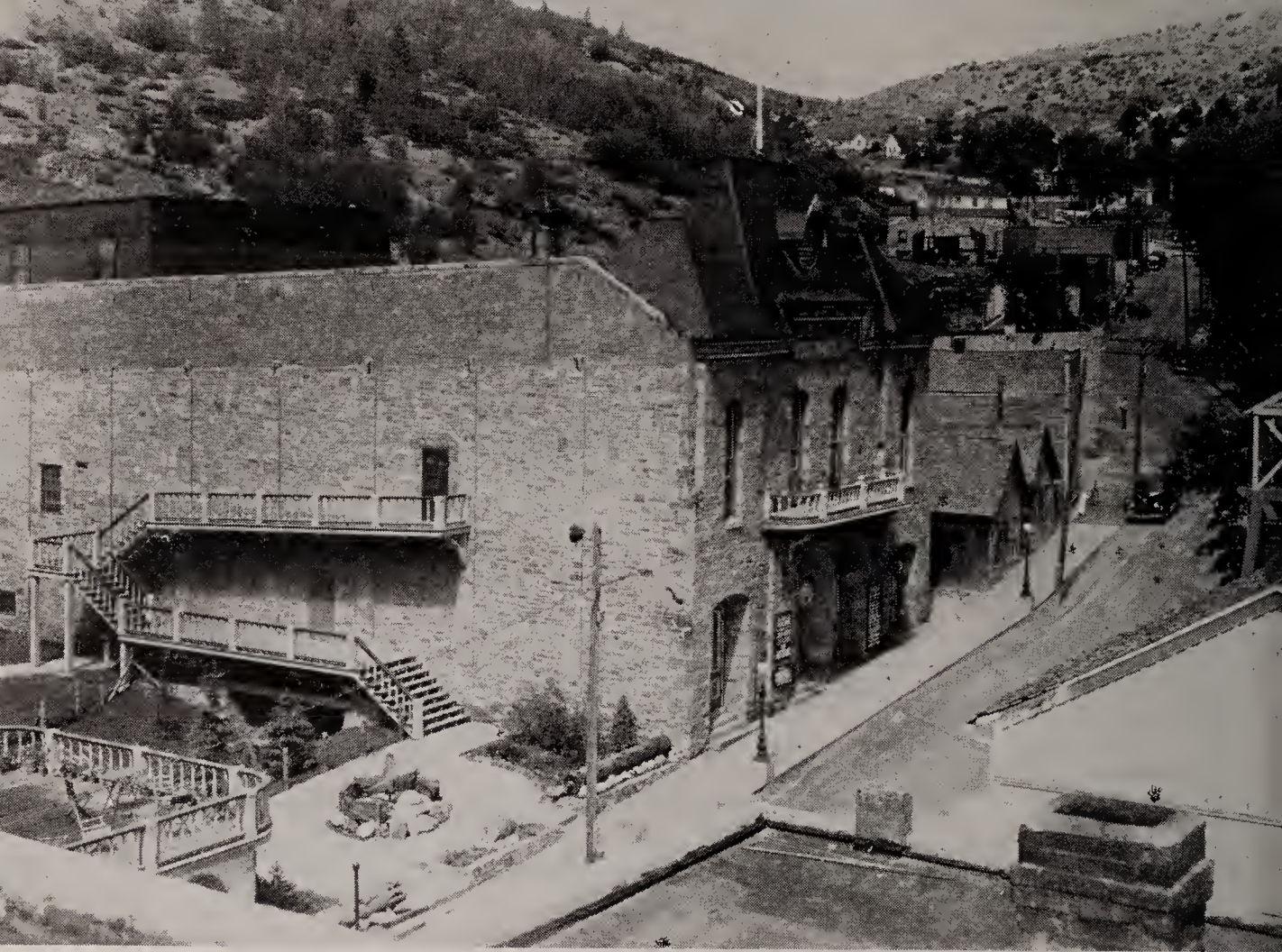
Photo by M. Walter Pesman



ABOVE—THE IDA KRUSE McFARLANE MEMORIAL

BELOW—THE OPERA HOUSE GARDEN Photos by S. S. Newbury







ABOVE—ST. JAMES METHODIST CHURCH, BUILT IN 1872 Photo by James S. Holme
LEFT, ABOVE—LOOKING UP EUREKA STREET Photo by S. S. Newbury
LEFT, BELOW—CHARACTERISTIC CENTRAL CITY ARCHITECTURE

CENTRAL CITY AND HIGH ALTITUDE HORTICULTURE

BY M. WALTER PESMAN

"What next, Central City?" Have you reached the end of your advance? From undefiled natural beauty you have traveled through the gold and silver period to the dead-city stage, then you have experienced a rebirth, achieved national recognition. Your hillsides have changed from columbine and kinnikinnik to a fascinating combination of slag and yellow roses, then to a glory of delphinium and poppy, pansy and sweet pea. Is this the final goal? Or are you headed to greater things in horticulture and in indigenous charm?

Central City has served as a symbol in many respects. We can take it as a symbol of the future of high altitude gardens.

What makes the Iceland and Oriental poppy glow at 7,000 feet and higher with a brilliance not seen at lower altitude? Why do pansies and sweet peas keep blooming at Central City and Estes Park while looking washed out in Denver?

We might go a step farther and ask, for instance, why high altitude head lettuce is considered unsurpassed in quality, and why Colorado leads the United States in fall shipment of cauliflower, much of which is grown in the San Luis Valley at an elevation well over seven thousand feet. If we can find the answer we may be able to point the way to a highly important new development in Colorado horti-

THE VIRGINIA CANYON ROAD, BETWEEN IDAHO SPRINGS AND CENTRAL CITY

Photo by S. S. Newbury





LOOKING WEST FROM THE GLORY HOLE

Photo by James S. Holme

culture. For much of our state is in the high altitude region.

The Colorado Yearbook lists 230 towns and cities; 63 of them are above 7,000 feet in altitude, 15 between 8,000 and 9,000, such as Black Hawk, Georgetown, Woodland Park and Lake City; 12 above 9,000, such as Fairplay, Silver Plume, Ward and Silverton; and there is Leadville at 10,190 feet above sea level.

Some of these towns have already established a reputation for specialty crops, such as Granby for lettuce, Monte Vista for potatoes, and Buena Vista for mountain peas. Cauliflower does exceedingly well up to 8,000 feet elevation. Spinach, onions and celery are being developed as high altitude crops. Wild hay production totals almost half a million tons in good years; with the present high prices who says "That ain't hay"?

So stands the record in 1946. To make a prediction for the future we need to get down to basic factors. And we also need to collect some less known facts of what is actually being done

even now. How many people know, for instance, about the successful cultivation of pyrethrum in the neighborhood of Pagosa Springs (at an elevation of about 7,500 feet)? How little is generally known about the horticulture of the San Luis Valley, interesting as it is?

Schimper, in his "Plant Geography," attempts to analyze the effects of altitude on plant life. Some of the factors, such as increased rainfall with increased elevation, a greater variation of temperature and a shorter season, correspond to the changes with higher latitude. In accordance we can expect some of the lush growth of Great Britain (and of Victoria in British Columbia) at Idaho Springs, Central City and Crested Butte, for instance. To a certain extent some other factors are common to both altitude and latitude, and it has been pointed out that one can see similar plant changes by either going up two thousand feet, or by going north ten degrees in latitude. There are, for instance, more actinic, or chemical rays in both cases, prob-

ably causing more vivid colors in flowers.

On the other hand, the rarefied air at higher elevations brings about an entirely new set of conditions that cannot be duplicated at northern latitude.

Thus we find at Central City a plant association quite different from that at any low altitude, though it may graduate into that of adjoining regions. There is an intensity of light, a variation of sun and shade, and a rapid alternation of moisture and dryness of the air, that is quite unique. We find cushion plants studded thick with flowers, and woolly-leaved plants well adapted to these conditions.

Up to this point we have generalized in our analysis; now we need to show variations between different regions, even with the same altitude. Ouray and Alamosa are at similar elevation (around 7,500 feet.), but the former has a rainfall of well over 30 inches per year, the latter of less than

eleven. No wonder Ouray can grow the native boxwood-like Mountain Lover (*Pachystima myrsinites*) and Alamosa can't even use the English Privet as a hedgeplant. (Idaho Springs is reported as having an annual precipitation of 14.83 inches, Central City has closer to 20 inches.)

Then there is the variation in the length of growing season: the extreme is Telluride, where one year the latest killing frost was July 31, and another year the earliest killing frost August 1. What chance has a tender plant in such a climate?

To return to our knitting (or should we say "to our sowing"—and other high altitude gardening?), what does all this have to do with the future of gardens in Central City and other mountain towns? Just this, that the very conditions that make plant growth difficult in one respect, give an opportunity for specialties in another respect. We may confidently look forward to interesting developments in mountain gardening.

REVEGETATION IN PROCESS, TRAIL RIDGE ROAD



How can we apply this knowledge to a very practical question: what to plant at our mountain cabins?

Suppose you have a summer home above the Opera House? (yes, it would almost be sure to be "above" it!)—what would you grow? There are three types of plants that will do well. First, of course, the very hardy things that will stand the "gaff" almost anywhere.

The matrimony vine is a good example (*Lycium halimifolium*). You don't have to worry a single minute about its growing, only about getting rid of it once it takes a hold. Virginia Creeper (*Parthenocissus quinquefolia*) is a sure thing, so is Bouncing Bet (*Saponaria officinalis*); Golden Glow and Goldenrod are dependables, Wild (Mock) cucumber (*Echinocystis lobata*) is apt to become an unwelcome guest, once established, and so is Mullein (*Verbascum thapsis*). The ma-

genta phlox and the Creeping Bellflower (*Campanula rapunculoides*) can be counted on to grow and to keep on growing, crowding out most other perennials.

The second group of plants that you could and should grow consists of the natives, the most striking ones of which are mentioned in the Norton article in this number (pages 3 to 6). Among them are Thimbleberry and Native Spirea (*Holodiscus*) both very ornamental shrubs. The only difficulty is that many native plants are not easy to transplant. For success it is best to buy them from a reliable nursery rather than to dig the "wild" ones.

To the third group (introduced plants) belongs the Yellow Rose mentioned by Prudence Bostwick in her article and by Mrs. Marriage on the Opera House garden. All of the introductions enumerated by them have

HIGHWAYS NEED NOT BE BARE AND UGLY—ENTRANCE TO GLENWOOD SPRINGS, COLO.



Photo by M. Walter Pesman

proved themselves over a long period of years; practically all of them will grow equally well in other mountain gardens. Places with more rainfall, like Ouray, are apt to show a wider variety; annual babybreath (*Gypsophila elegans*) is very good there as well as in Boulder County. On the other hand, places with alkaline soil, like the San Luis Valley, have a more limited choice.

To this third group of introduced plants will be added a great many more as time proves them. Many rock garden plants from various parts of the world will find a congenial home in Central City and other high altitude towns. New England perennials such as *Trillium* and *Bloodroot* show good promise if planted in moist, protected nooks, where ferns and columbines thrive. Almost any type of bulb can be grown in medium altitudes; and their color is often more intense than at lower elevations. That is also true of Iceland and Oriental Poppy, Pansies, Bleeding Heart, *Delphinium*, Sweet William and of many common annuals.

The proposed Rocky Mountain Botanical Garden intends to have substations at various elevations where plants from other mountain regions will be tried out: Ural mountains, Chile, Bolivia, South Africa, China. Such a procedure will add dozens if not hundreds of new species to our flora. Central City has been mentioned as one of these substations. This might add another glory to its luster.

Dreams of the future? Yes, but dreams that can be realized. There is another dream nature lovers covet about much of this mountain mining country, a dream of revegetation. Roads, prospect holes, dumps and abandoned mines have left the natural landscape badly scarred. The result of placer mining and settling basins is

even more ghastly. Central City and surroundings, being an old camp, shows the beginning of revegetation. If left to nature alone this is a very long process. Scientific observation on the Rampart Range slope places the time at not less than 25 years, even to get the original stand of grass back. For the re-establishment of tree growth it may well take fifty years and more. But man has now learned how to cooperate with nature.

The result of this speeded up revegetation is encouraging. Native grasses, wild roses, raspberries, chokecherries, and on large stretches evergreen seedlings, all do their part. Virginia creeper and hopvines help to cover over prospect holes (but dangerous places must be clearly marked!). Old abandoned roads can be partly resodded, partly planted out by skillful shrub planting. Aspens are not difficult to transplant if there is enough moisture. Ponderosa pine, Limber pine and Bristlecone pine do well in most places. Lodgepole pine is not quite so adaptable.

On barren slopes we have found "plantpockets" a practical way of starting a few growing spots. In these pockets of good soils can be planted seeds of native plants, chunks of grass-sod, even shrub seedlings. The most adaptable plants will start first, others will follow as conditions become right. Even here we must follow nature's own sample of evolution, which we can speed up to a certain extent.

Yes, Central City is a symbol. It is also a sampling ground. Let us trust that its revival is of many kinds, and that it will show us what we can do to use our natural resources in the best possible way.

"We shall know a world transfigured,
Which our eyes but dimly see;
We shall make our towns and woodlands
Beautiful from sea to sea."

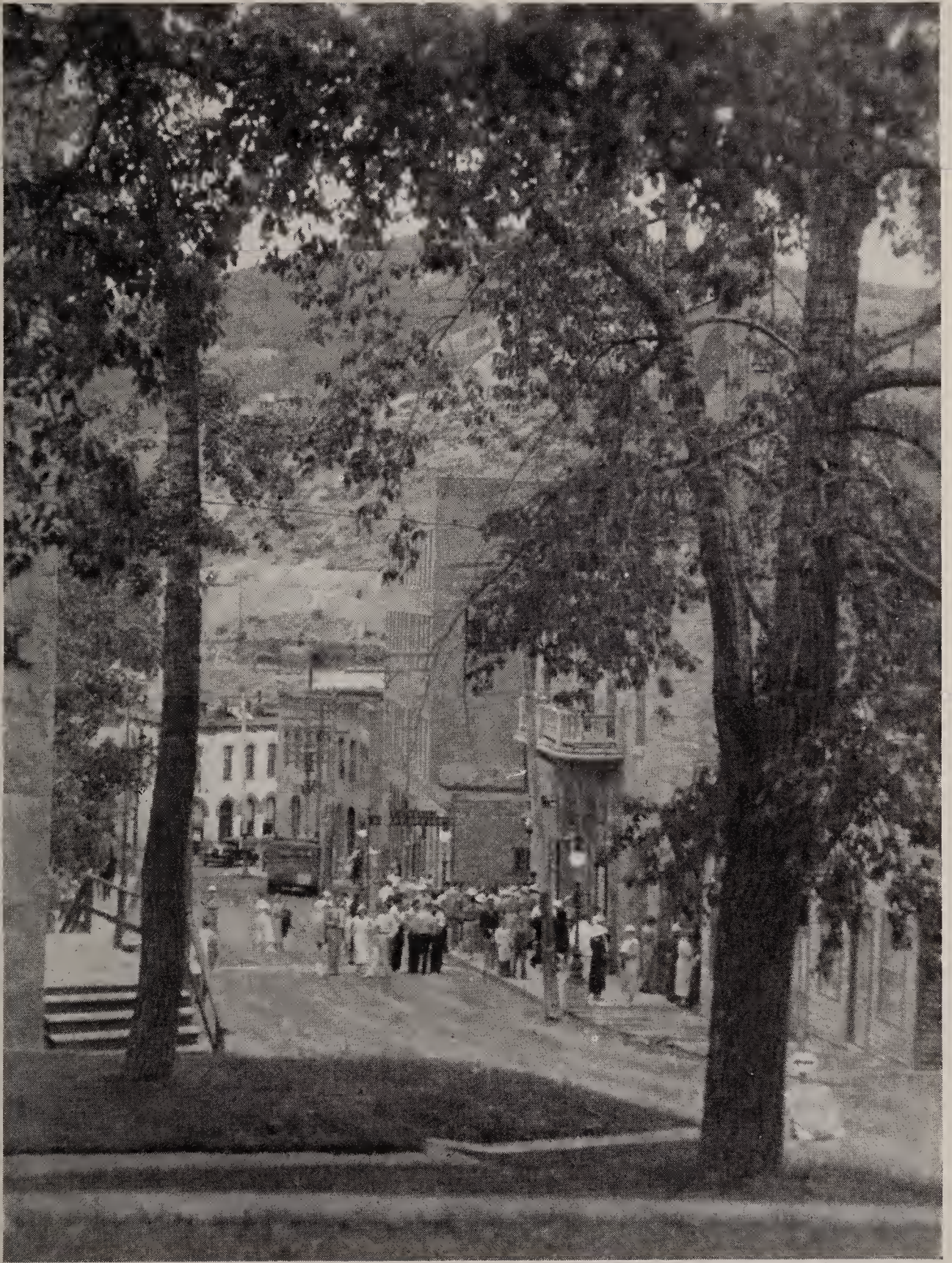


Photo by S. S. Newbury

COTTONWOOD TREES ON EUREKA STREET, NEAR THE OPERA HOUSE

THE ARTISTS and AUTHORS

Muriel V. Sibell (Mrs. Francis Wolle), whose painting "Central City Terraces" has been reproduced on the cover of this Central City issue of "THE GREEN THUMB," began to record Central City in 1926, when many more buildings were standing than are to be found today. In 1932 and 1933 during the Opera House Festival she had an exhibit of her sketches in one of the stores on Eureka Street.

In 1933 she published a book, "Ghost Cities of Colorado," which features Central City and contains illustrations and text gleaned from old newspapers.

Each year she has added to her collection of paintings and drawings of Central City and other mining communities and is at present preparing a book on the many ghost towns of the entire state.

Miss Sibell is Professor of Art and Head of the Fine Arts Department of the University of Colorado.

The editors of "THE GREEN THUMB" acknowledge with appreciation Miss Sibell's generous permission to reproduce her painting.

O. R. Maxson, Bachelor of Fine Arts, University of Denver. Research and Design Department Airway Manual. Previously assistant to M. Walter Pesman, in which capacity he collaborated on numerous plant drawings and illustrations of landscape design.

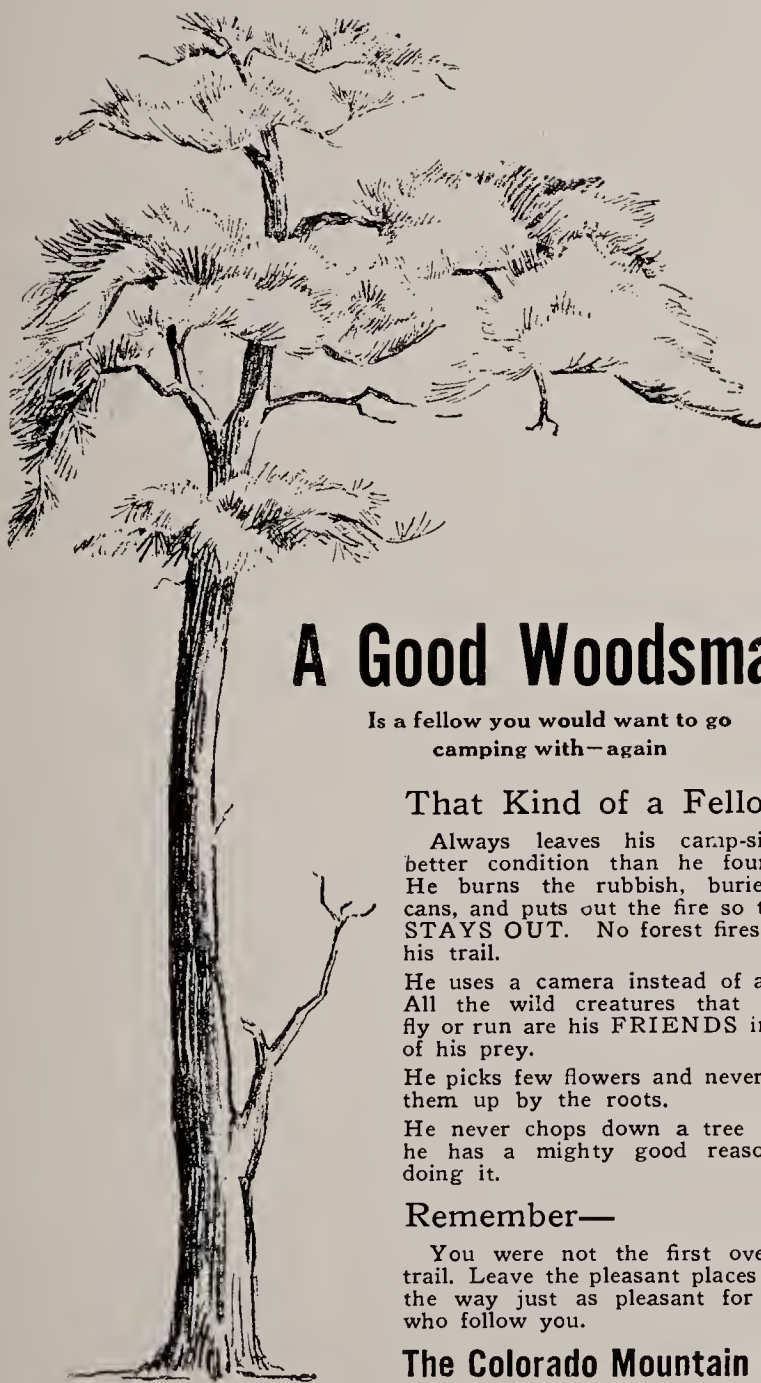
Mark and Claire Norton are noted writers on horticultural subjects (The Perennial Gardener). They have experimented for years in domesticating Colorado native plants.

Prudence Bostwick received her Ph.D. from Ohio State University. She has been a teacher in the Denver Public Schools in the field of Biology, English and Social Studies. Miss Bostwick is now Supervisor in the Department of Instruction in the Denver Public Schools.

Kathleen Marriage, for many years owner of Upton Gardens, Colorado Springs, is a well known horticulturist and writer. She is noted for her interest in botany and alpine plants. Mrs. Marriage has had experience in horticulture in both Great Britain and the United States.

M. Walter Pesman, Landscape Architect and Land Planner. Pioneer in Colorado Roadside Development, Denver Schoolground planning and Memorial Parks. Author of "Meet the Natives," handbook of Rocky Mountain trees, shrubs and wildflowers. For many years Instructor at Denver University in Landscape Architecture. He was president of the original Colorado Forestry Association, and instrumental in its reorganization.

The pen and ink sketches of the Harison Yellow Roses on Page 1 and on the back cover are the work of Margaret Doppelmayr, young Denver artist and former pupil of Vance Kirkland.



A Good Woodsman

Is a fellow you would want to go
camping with—again

That Kind of a Fellow—

Always leaves his camp-site in better condition than he found it. He burns the rubbish, buries the cans, and puts out the fire so that it STAYS OUT. No forest fires mark his trail.

He uses a camera instead of a gun. All the wild creatures that crawl, fly or run are his FRIENDS instead of his prey.

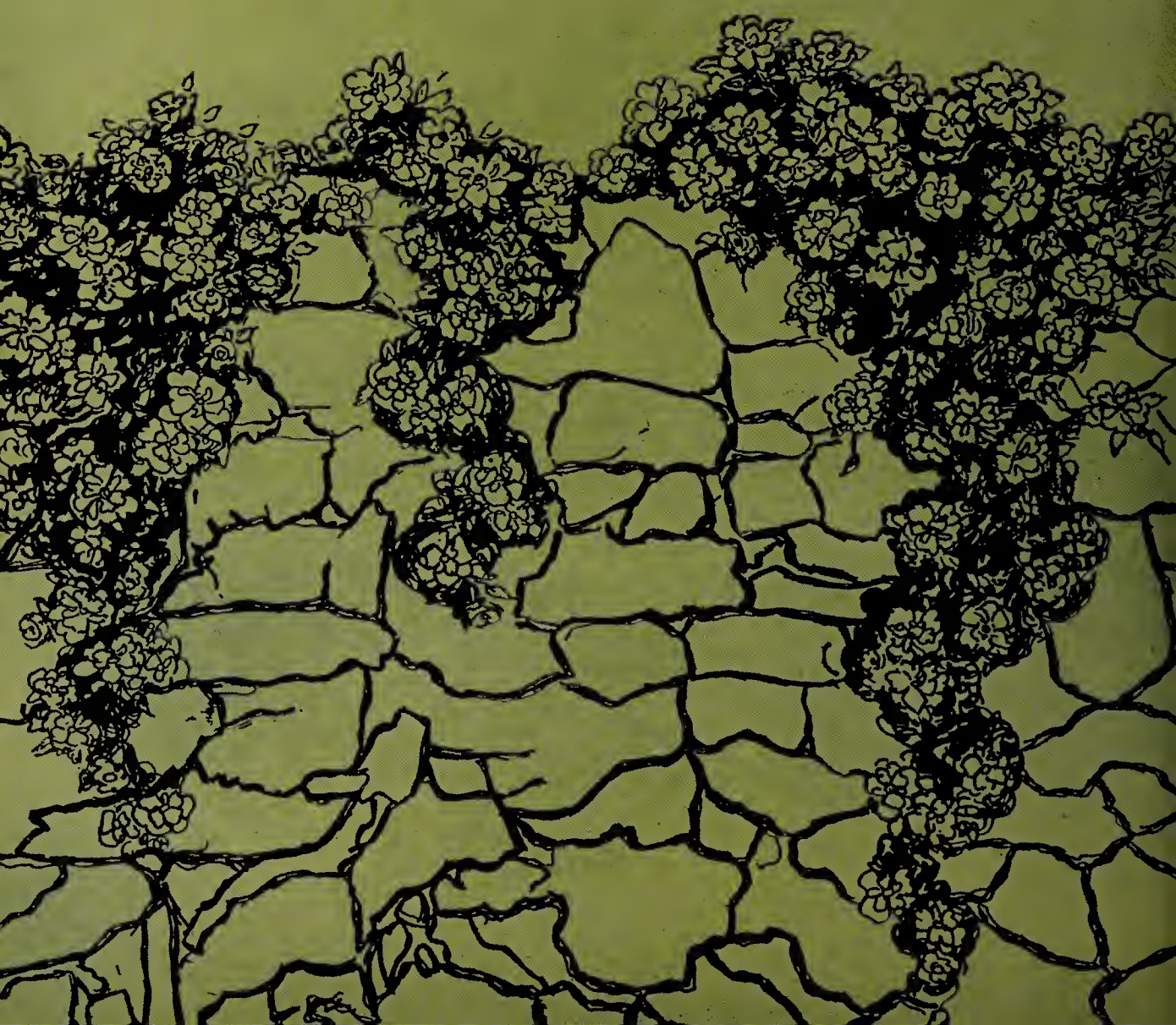
He picks few flowers and never pulls them up by the roots.

He never chops down a tree unless he has a mighty good reason for doing it.

Remember—

You were not the first over the trail. Leave the pleasant places along the way just as pleasant for those who follow you.

The Colorado Mountain Club



The Green Thumb

September—October, 1946



~~~~~ THE GREEN THUMB ~~~~~

A Bulletin of the

COLORADO FORESTRY AND HORTICULTURE ASSN.

Organized in 1884

George W. Kelly, Editor

Miss Alice Wood, Assistant to the Editor

L. C. Shoemaker, Office Manager

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"To preserve the natural beauty of Colorado; to protect the forests; to encourage proper maintenance and additional planting of trees, shrubs and gardens; to make available correct information regarding forestry, horticultural practices and plants best suited to the climate; and to coordinate the knowledge and experience of foresters, horticulturists and gardeners for their mutual benefit."

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VOLUME III

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HEADQUARTERS BUILDING

REMODELING of the building at 1355 Bannock to be used as a headquarters for our association is progressing rapidly. We plan to devote a large part of the November issue to details of the plans for this building. We hope to make it

the real horticultural center of the state. Already there is a very good start towards a horticultural library and plans are progressing for an herbarium, and scientific laboratory. There will be a continuous series of lectures and classes on home landscaping for veterans.

THE SUMMER OUTING

A JOINT meeting of the Colorado Forestry and Horticulture Association and the Colorado Mountain Club was held at Buffalo Park on July 14. The group first met at the Forest Service picnic grounds, "Top of the World" and ate lunch together. This beautiful spot is well named affording a grand view in all directions. After lunch all drove down the hill to the Glenmore Arboretum of Robert E. More. This is a very interesting place where Mr. More has protected all the native plants and introduced many of the natives not already growing there. He has also experimented with many of the

evergreens of the world, and has 156 different varieties and types of evergreens growing on his premises, out of about 250 that he has tried. Mr. More has 50 additional varieties of evergreens in experimental frames in Denver.

Over 125 people attended, coming from Denver and other Colorado towns in Colorado, as well as many places out of state.

The Glenmore Arboretum is Colorado's only arboretum at present and Mr. More is to be congratulated on making this fine start. We are hoping that the Association may soon develop plans for a more extensive arboretum for Colorado.



OAK TREES IN DENVER

By S. R. DeBOER

THE LARGEST group of oak trees in the Denver area are the Red Oaks in the Civic Center. They were planted in the spring of 1914. Denver had a Park Commission at that time, and the plans of Mayor Speer were arduously worked on from one administration to the next. The city owes a good deal to this early Park Commission, especially to the outstanding Presidents Jacob Fillius and his successor John McBeth. The latter was president of the Park Board during the episode of the Red Oaks.

Before the planting of the Civic Center Oak trees there were only two or three Red Oaks in the City. These were in Fairmount Cemetery and in Platte Park. There was a line of Burr Oaks on the Brown farm near Littleton. The Park Commission hesitated on the proposal but after several weeks of deliberation decided to follow the recommendation of planting Red Oaks in the Civic Center. To protect ourselves against a possible failure it was decided to plant Ash trees between the Oaks.

A carload of Oak Trees was shipped in from Meehan's Nursery in Germantown, Pennsylvania. On account of the time lost in deliberation, however, the trees did not arrive until the 17th of May, and when they were unpacked the buds were opening and white. It looked like the Oaks could not possibly live. We had had holes for planting them dug before, and instead of heeling the trees in we proceeded to plant them direct from the railroad car. The bark of the trees was protected by burlap and we kept them watered in the ground as well as sprayed on top. It was a painful operation. Old John Ziegler, one of the most careful planters of all times, planted the Red Oaks. The Ash trees had been planted earlier and started to leaf out im-

mediately. The Oak trees were slower and we made daily counts to see how many were showing progress. By the end of the summer it proved we had lost only 3 or 4 trees, and that all the others were sufficiently mature to go through the winter.

As the years went by some trees were lost through disease and these were replaced out of the stock of the Park Nursery. In this way it happened that other varieties slipped in and today the grove is not purely Red Oak any more. There are a few White Oak and several Burr Oak. Many years later a number of Burr Oak were planted in other parts of the Civic Center.

As the Oak trees began to be fully established we cut down the Ash trees and gave all the space to the Oak trees. In later years many Red Oaks were planted in the other Parks. There are some good specimens in the North end of Washington Park. There are some smaller ones in the South end of Washington Park. City Park has a few specimens of Pin Oak, White Oak and Burr Oak. At Sloans Lake Park a number of Pin Oaks were planted as well as Red Oak. These have done unusually well and at 26th and Tennyson Street there are now specimens of Pin Oak which are of mature size, and which are unusually beautiful.

Along Forest Drive between Broadway and Logan a thicket of trees was planted. The road here is narrow and the early plan was that it should be widened as traffic demanded it. This gave us a good opportunity for growing Red Oaks in the thicket which would gain maturity by the time the road would be widened. These trees were planted 30' apart and today are well established, though the road has not been widened.

West of Broadway between that



street and Bannock Street a line of Burr Oaks were planted. These trees were grown from acorns picked from the Oaks on the Brown farm. They are hard to transplant and grow very slowly, but have now reached the point where they are beginning to take on the mature shape.

There are scattered Red Oaks in Cheesman Park, in the Sunken Gardens, in Lincoln Park, in Platte Park, and in several of the other parks. Colorado Scrub Oaks are found in Washington Park.

Perhaps the best collection of Oaks in the West is on the place of

Mr. and Mrs. John Gates. In their garden have been planted Pin Oaks, Red Oaks, Scarlet Oaks, a White Oak, a Pyramidal English Oak, a Shingle Oak, a Harvard Shrub Oak and others. Mrs. Gates has specialized on this oak grove and has spent no end of effort on making it as complete as possible.

Today the Oak tree has become well established and may be considered our best shade tree. The reason it is not planted more, is due to the slow growth. Many people hate to wait a long time for a mature tree.

WE CAN—AND DO—MAKE WEATHER

Prepared by the U. S. Forest Service

MARK TWAIN was always brash—but he was 28 and fairly sophisticated when the book was published which, if read, might have kept him from ever minting that immortal bon mot about the weather.

Perhaps he never read it, however, being much too occupied with writing books for others to read.

At any rate, in 1863, a thick tome was published with the title **Man and Nature**. Through later editions and revisions, it got to be called **The Earth as Modified by Human Action**. The object of the volume, said its author, George P. Marsh, was "to indicate the character and, approximately, the extent of the changes produced by human action in the physical conditions of the globe we inhabit."

His monumental erudition throughout 617 pages of fascinating text revolve upon a thesis embodied in these statements:

"The extension of agricultural and pastoral industry involves an enlargement of the sphere of man's domain, by encroachment upon the forests which once covered the greater part of the earth's surface otherwise adapted to his occupation. The felling of the woods has

been attended with momentous consequences to the drainage of the soil, to the external configuration of its surface, and probably, also, to local climate; and the importance of human life as a transforming power is, perhaps, more clearly demonstrable in the influence man has thus exerted upon superficial geography than in any other result of his material effort."

In a few sentences the author then throws off the suggestions of ditching and draining, irrigation, dams, and bulwarks, to build land by sea action.

"Besides these old and comparatively familiar methods of material improvement," concludes Marsh in a burst of prophecy, "modern ambition aspires to yet grander achievements in the conquest of physical nature, and projects are meditated which quite eclipse the boldest enterprises hitherto undertaken for the modification of geographical surface."

Marsh never, with his fecund imagination, could have envisioned the "grander achievements" that are now, some of them, at least, "old and . . . familiar," others well past the blueprint stage. Grand Coulee, for example, the Dneiper-

stroy, TVA; and, to come, the planned structures in the Missouri Valley, and the giant of them all to be, the dam and hydro-electric plant that will harness the ancient flowing Yangtze's sleeping power.

Every day, in fact, man accomplishes with some act, something which libels the homely inaccuracy already inherent to Mark's statement about the weather. Take a look, for example, at the so-called "copper basin," 50 miles from Chattanooga, in southeastern Tennessee.

Here, fumes from a big copper smelter have killed every last bit of vegetation, leaving the land as bare as a rock pile on a surrounding area of 7,000 acres. Around this barren, deeply eroded core is a belt of grass and broomsedge from one to two miles wide, and outside that is hardwood forest thus far unaffected by the fumes from the smelter.

Such a spot, deplorable in itself, was the equivalent of a ready-made, outdoor laboratory, however, to C. R. Hursh, scientist attached to the Appalachian Forest and Range Experiment Station, a branch of the Forest Service, U. S. Department of Agriculture, at Asheville, North Carolina. Coming upon it four years ago, Hursh began intensive meteorological research, near Ducktown, Tennessee, which by now indicates that one of Marsh's "grander achievements" of mankind has been working its will on Twain's weather for a long time.

In brief, Hursh's observations support the theory that large-scale human activities such as irrigation projects, extensive tree planting programs, draining swampland, or clearing natural forests, actually do modify local climate, affecting tem-

peratures, wind movement, and amount of rain. So, if such is the case, the tree planters, swamp drainers, and loggers have really been changing local weather patterns, lo, these many years.

Since coming to this Tennessee "badland," Forester Hursh measured and recorded at regular intervals the air and ground temperatures, wind movement, and rainfall in the three areas—the central eroded core, outer belt of vegetation, and outside hardwood forest. Among other findings, Hursh reports that from June to November the average monthly maximum air temperature was from 2.1 to 3.5 degrees Fahrenheit higher out where the fumes had killed off the grass and trees than in the forest, that wind movement two feet above the ground was from .5 to 15 times faster in the open than in the forest, and that less rain fell in the bare zone around the smelter than in the surrounding grass and forest belts.

Hursh's records also show that on clear summer days air flowing from the forest was heated almost three degrees in passing over the grass and bare zones of the copper basin.

The scientist also found that evaporation from free water surfaces, such as lakes or streams, was far greater outside than inside the forest, the yearly amounts from experimental water containers being 56.95 inches for the bare area, 46.19 for the grass zone, and 17.76 for the forest.

Such findings are useful in connection with solving problems of forest land management, fire protection, windbrakes and shelterbelts, and in "the general employment of vegetation in modifying local climate to man's best interest."

Too many give up when crabgrass takes a lawn. When crabgrass spoils the looks of the lawn the most, is the time to give the lawn the best of continuous care. Crabgrass is dying then, but bluegrass is just coming into its best season for growth. Forget fighting the pest and pet the bluegrass.—George Beach.

NEWER PERENNIALS FOR COLORADO GARDENS

By MAUD McCORMICK

MANY gardeners from Maine to Missouri hold that our native plants are of little value to them. Conversely, we feel that their perennials, used to greater humidity and less temperature variation, can adjust themselves to our conditions only with great difficulty. Unless their soil-requirements are definitely acid, however, we can usually keep them thrifty during the season of growth.

When winter comes, we would like to say to our gardens what Robert Frost said to his young orchard, "Goodbye and keep cold." Instead, we must mulch wisely to **keep** the plants cold if we expect to find the choicest ones alive at the end of a snowless winter when temperatures have varied from spring mildness to sub-zero. Consequently, the small, protected gardens tended with intelligent industry shelter the newer varieties of perennials.

Clematis Davidiana is one of these, grown here successfully, I am told, though I have never seen it. A shrubby perennial like the buddleias, reliably root-hardy, its neat plants vary from 18" to 36" in height and its fragrant blooms of blue and white tolerate the heat of midsummer. Double pyrethrums are still hard to secure, but the named English varieties, from the unusual salmon single, **Mrs. Bliss**, to all the doubles, including the shell-pink **Lillie Morgan**, are worth waiting for. Even a new Shasta daisy, the sturdy, everblooming **Mount Shasta**, has earned a place among the garden nobility as "perhaps the best white flowering herbaceous perennial to date."

Companion to **Mount Shasta** and as constantly in bloom are the large-flowered pentstemons, not always hardy without protection. In a border swept by northwest winds,

I have watched the variety known as "Garnet" come up spring after spring, but **P. Shonholzeri** from Switzerland, known to us as "Cherry Glow" or "Firebrand," died in an unprotected nursery row last winter. Perhaps mulching would have saved it. Certainly its clear ruby flowers produced all through August's dearth of bloom make it worth special care or even frequent replacement.

Still more valuable to us are the new hemerocallis, now to be had in bloom all the growing season if varieties are selected with long-season bloom in view. Here **H. Minor** may be caught by late spring cold and **Autumn Prince** and **August Pioneer** may fail to bloom when Jack Frost comes too early, but they are lovely in our more gracious seasons. The color-range of hemerocallis now extends from creamy **Moonbeam** to wine-purple **Theron** with countless variations of red, gold, canary and bi-colors in between. In size, too, there are the dainty stars of **Boutonniere** and the giants **Hesperus**, **Caballero**, and our own Mr. Bechtold's magnificent **Goliath**. Pest-free and entirely hardy if we select kinds developed where they have a period of dormancy, there is probably no other perennial we can so ill afford to neglect.

Many plants are worth mentioning for color improvements that make them acceptable in our gardens. Tritomas now comes in soft yellows, monardas in white and lovely salmon pink, heucheras, astilbes, and platycodons in clear pinks and in white, chrysanthemums in everything but blue, and delphiniums in all save yellow and red. All these and many, many more and rarer plants are perennials worth trying in Colorado.

THE MORTON ARBORETUM

By GLADYS C. EVANS

HAVE you ever been to the Morton Arboretum? If not, and you are near Chicago, it will richly repay you to see it—located at the town of Lisle, thirty miles due west of Chicago, it is not over an hour away by paved highway or by suburban train. Here was situated the original Illinois farm of J. Sterling Morton, great student and lover of trees and the founder in 1872 of **Arbor Day**. Of these eight hundred acres of beautiful wooded hills and valleys along the Du Page River his family, some twenty-five years ago created in his memory a **distinguished Arboretum**. Maintained through private endowment and administered by a self perpetuating Board of Trustees.

Here a great educational work is carried on without charge for all, young and old, who are interested to come. Beautiful stone buildings house an extensive horticultural

library replete with rare and priceless volumes, a large herbarium, lecture halls and class rooms, where all manner of subjects pertaining to horticulture, farming and botany are taught. These centers of educational work are located in the great out-of-doors laboratory constituting the Arboretum itself. Through these eight hundred acres many miles of paved roadways and nature trails have been constructed, making the growing, well marked exhibits, readily accessible for study.

The grounds are open every day from sunrise to sunset and all visitors whether nature lovers, or students or merely sightseers enjoying the beautiful park, are welcomed without charge.

More than 4,800 species, varieties and hybrids of the woody plants of the world are now included in the living plant collection.



Forest native trail along the bank of the Du Page River

Plantings are arranged according to four classifications:

1. Systematic groups defined by botanical relationships.
2. Geographical groups according to native habitats.
3. Ornamental plantings to create landscape effects.
4. Economic plots where trees are tested for timber value.

The labels on trees and shrubs indicate botanical and common names, accession and location numbers. These numbers refer to a card catalogue which gives the location, origin and history of every species and variety represented. This catalogue may be referred to in the Administration Building.

Some of the outstanding features of the Arboretum are.

Spring Wild Flowers (May-June).

Flowering Crabapples (flowers

during early May, fruit in autumn).

Hybrid Lilac Collection (flowers in mid May.)

Garden of over 300 species of old fashioned roses (June).

Lotus Blossoms (July-August).

Hodge Garden (see illustration).

Ground Cover Collection. Comprises plots of seventy-two ground cover plants adaptable to various soils and exposures.

Many Nature Trails (including the notable Evergreen trail).

Fall Foliage Color Display (October).

So greatly have I enjoyed visiting the Morton Arboretum that I urge every member of the Colorado Forestry and Horticulture Association, not to miss the opportunity of spending some hours there, should they be in the vicinity of Chicago.



Hedge Garden— A formal development—one hundred and ninety-five examples of formal and informal hedges



Showing the "Rabbit's foot" that gives the fern its name

THE accompanying pictures are from the home of Mrs. L. V. Woods, 901 S. Ellipse Way, Denver. Mrs. Woods is one of those fortunate persons who were born with a Green Thumb. She has a great variety of rare and unusual plants growing both inside and outside her home, and every plant looks contented and happy. For instance she has a beautiful espallier apricot against her garage wall, she grows hepatica and trillium, viburnum carlsi and burkwoodi both do well and she can even raise ar-

bor vitae. The ferns shown in the above picture and the one on the front cover, are called the "Rabbits foot Fern", the reason being clearly shown in one picture. The most recent addition to Mrs. Woods garden is a small "dry" wall, where she grows many kinds of interesting rock plants.

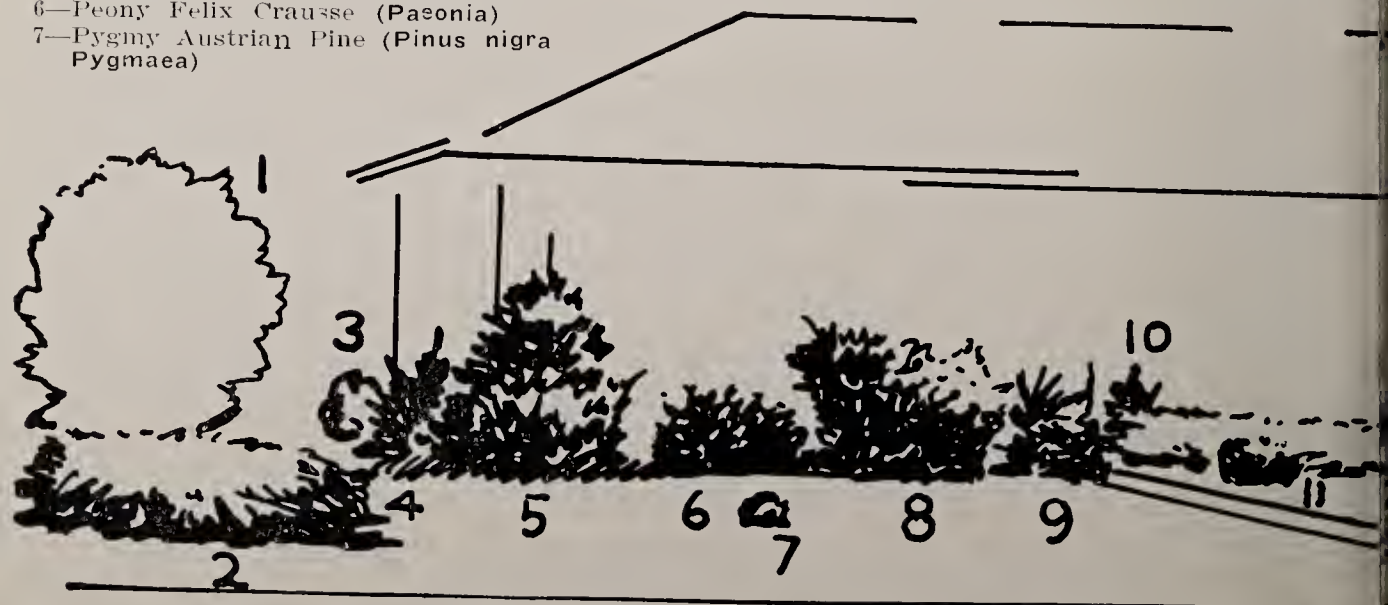
It is an inspiration to anyone who loves plants to see this place and note the quantity and quality of beautiful plants that can be grown on a very small city lot when they are given the care and love of a person which has a Green Thumb.





UNUSUAL FOUNDATION PLANTING OF

- | | | |
|---|---|---------------------|
| 1—Lilac Leon Gambetta (<i>Syringa vulgaris</i>) | 8—Redleaf Japanese Barberry (<i>Berberis thunbergii atropurpurea</i>) | 13 and 15—Froebelli |
| 2—Koster Eastern Redcedar (<i>Juniperus virginiana kosteri</i>) | 10—Umbrella Pine (<i>Sciadopitys verticillata</i>) | 14—Russian Sav |
| 3—Weigela Bristol Ruby (<i>Weigela</i>) | 11—Japanese Yew (<i>Taxus cuspidata</i>) | sabina prost |
| 4 and 9—Oregongrape (<i>Mahonia aquifolium</i>) | 12—Andorra Creeping Juniper (<i>Juniperus horizontalis plumosa</i>) | 16—Tamarix Sav |
| 5—Silver Limber Pine (<i>Pinus flexilis glauca</i>) | | sabina tama |
| 6—Peony Felix Crausse (<i>Paeonia</i>) | | 17—Hillbush Ju |
| 7—Pygmy Austrian Pine (<i>Pinus nigra Pygmaea</i>) | | ginalis) |



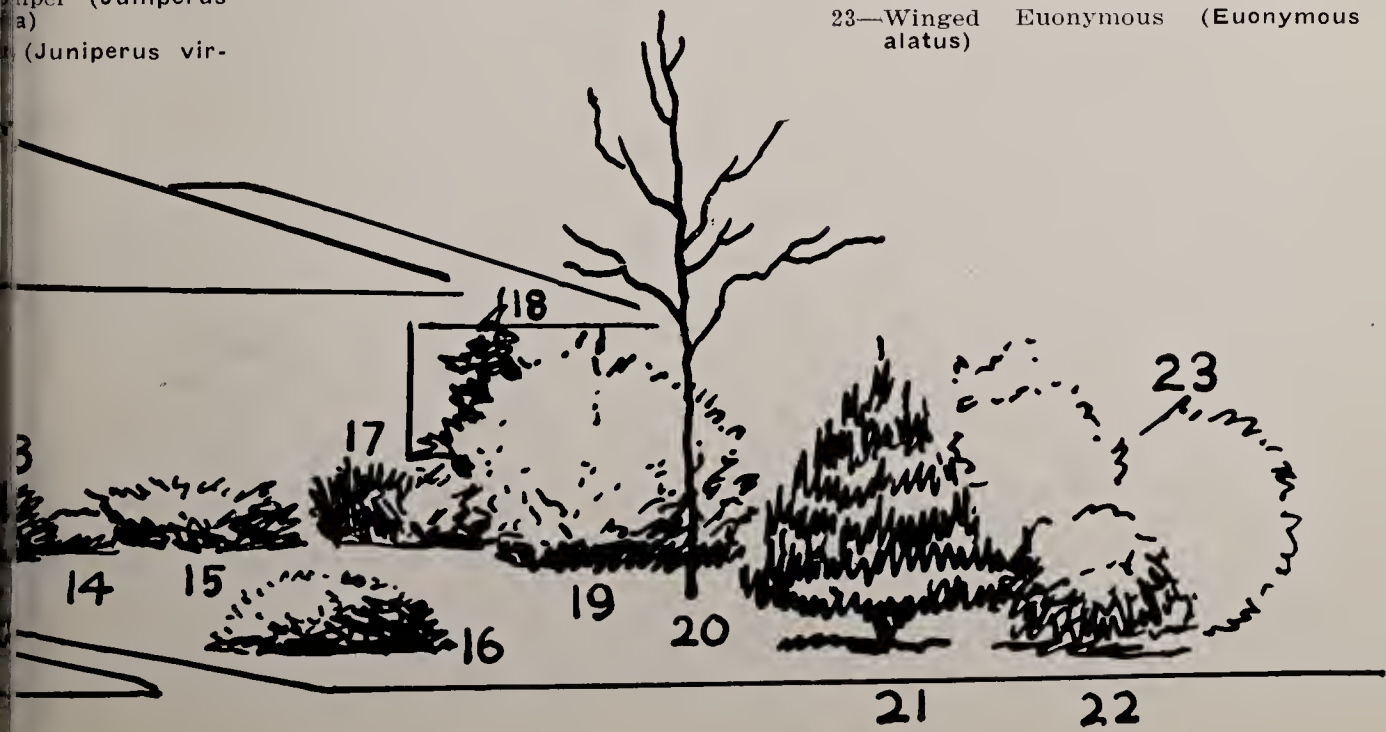


ERGREENS AND DECIDUOUS MATERIAL

a (*Spiraea froe-*
 iper (*Juniperus*
 li)
 iper (*Juniperus*
 a)
 (*Juniperus vir-*

18—White Fir (*Abies concolor*)
 19—Colorado Redosier Dogwood (*Cornus stolonifera coloradensis*) and
 Yellowtwig Redosier Dogwood
 (*Cornus stolonifera flavifoliosa*)

20—Southern Red Oak (*Quercus falcata*)
 21—Japanese Table Pine (*Pinus densiflora umbraculifera*)
 22—Garland Spirea (*Spiraea arguta*)
 23—Winged Euonymous (*Euonymus alatus*)





EVERGREENS—THEIR SELECTION AND CARE

By ROBERT E. MORE

This is the third article of a series. The prior articles are mentioned in the text.

III—VERY TALL TREES

EVERGREENS that reach a height in excess of thirty-five or forty feet are usually classified as "very tall." Their use at country and mountain homes and the larger urban residences is familiar to all. They are also frequently employed in landscaping the small house—which can be either a good use or a bad one, depending on the will power of the owner. Mention was made in the January article of the rapidity with which this group of trees get "out of scale." If they are well cared for, unrestrained in growth habits, and are owned by persons who are averse to taking out a living tree under any conditions, then a gloomy situation indeed develops. A white Pine can grow two or three feet a year with little or no effort, and a Colorado Spruce frequently gains eighteen inches in height from one spring to the next. Does this mean that this group cannot be used in landscaping the small home? Not at all. Any of them can be kept in bounds for years by well-known nursery practices, which were set forth in the May 1946 issue. And even if they are permitted to develop according to their own inclinations, they can be removed when they get too large. We take out perennials when they get out of hand, and we eliminate the old and leggy shrubs. Why then, do we hesitate to carry out the same sane practice with respect to a tree that has served a splendid purpose for eight or ten years, and now has outlived its usefulness?

So there are a variety of uses for these very tall evergreens. We shall now discuss the selection, use and care of certain individual trees.

First of all, consider the Colorado natives. Native trees are invariably hardier than exotics, so they

should always be given preference, when all other things are equal. At the head of any list must come the stately White Fir (**Abies concolor**). No better evergreen than this can be found for Colorado use. It has the symmetry of the Colorado Spruce, but a less obtrusive color. Its long, yet soft, needles, its freedom from disfiguring galls, and an easy adaptability to most soils make it the writers favorite evergreen. It will cost you money, however. It is a very difficult tree to handle in the nursery, until it is three or four feet high, and even then it is likely to scorch if given no protection from the west sun and wind. So either plant your White Fir on the east side of the house, or have some other planting to the west of it.

The White Fir can be retarded in growth by disbudding (plucking out in April, with thumb and first finger, the center bud in each group of three), or by cutting the new growth in half with grass shears—about June 1st. **Never** cut into last year's wood, however; this usually causes great damage. Disbudding in April, or docking the new growth in June will not only cause no injury to the tree, but it will make it thicker of foliage and more attractive looking. The two splendid White Firs shown on the next page were moved from Park Hill to Englewood last February. The tree on the right of the windmill is a full thirty-five feet high, and the earth ball weighed over six tons. Since the low branches kept the ground from freezing last winter, Mr. Andrew S. Larson, who moved the trees, froze the earth balls with dry ice before moving.

The Colorado Spruce (**Picea pungens**) needs no introduction. Its striking blue and silver colors are

famous the world over. Its growth also can be retarded by cutting the new shoots in half before the wood hardens. As the form of the tree is at its best when under twenty feet in height, there is this additional reason for replacing it, when it gets this large—at least around the small home. The Koster and Moerheim grafts are especially fine in color, though the shape of these varieties is often inferior to the ordinary types. An Aphid that employs the Douglasfir as an alternate host causes the ugly brown galls on the Colorado Spruce. These look like cones, and when numerous are very disfiguring. The Douglasfir should not, therefore, be planted in proximity to the Colorado Spruce. It is believed by some that the Aphid can exist on the Spruce alone without its other host tree. This pest is the Spruce's worst enemy.

A nicotine or lime-sulphur spray in April just before the buds break helps a great deal.

The Engelmann Spruce (*Picea engelmanni*) has proved inferior to the Colorado Spruce for horticultural purposes. The Engelmann likes the cool and moisture of high altitudes, where it grows naturally. Its form and color is usually inferior to that of the Colorado Spruce, also.

The Common Douglasfir (*Pseudotsuga taxifolia*) has already been mentioned. Providing a haven for the Aphid that causes the unsightly galls on spruce trees, it must not be used in conjunction with spruces. In addition, this tree seems to want more moisture and shade than is ordinarily found about Denver. In its native state in the mountains, it is always found on the north and east slopes. The relatively few

White Fir, at the home of Mr. and Mrs. Wm. H. Ferguson, Englewood, Colorado



specimens about Denver are inclined to be a trifle thin of foliage. The tree has never been pressed by Colorado nurseries, so there is not much local information relative to how much the foliage will fill out if disbudding or careful pruning is practiced. The tree is invaluable in landscaping mountain homes, where perfection of detail is not important. Probably the Douglas-fir would make an excellent north side boundary barrier in a city planting. The tree has few pests. Most hardy of the native evergreen is the Ponderosa Pine (***Pinus ponderosa***). In a survey of the pines (**Green Thumb** for September, 1944) this tree ranked first. As will be developed later, the writer prefers the Austrian Pine for city planting. But certainly the Ponderosa is a splendid tree.

Be sure that this tree has plenty of sun and room. If crowded, it soon drops its lower branches, and thus loses much of its beauty. The foliage is coarse, and the whole aspect

of the tree is rugged. Don't use it where daintiness is required, therefore. As the Ponderosa sheds needles in considerable quantity each fall, it goes through a "messy stage" at this time. The dead needles are all off the tree by cold weather, and can then be raked up. Like all pines, the needles come in "bundles." The Ponderosa usually has three needles in a bundle, four to six inches long.

The worst enemy of the Ponderosa is a pest that some believe is the spruce worm (with a taste for pine), and others swear is the tip moth. It is a bad actor, whatever it is. The "candles" develop beautifully in the spring—and then fall to pieces. Use an arsenic spray the last of April.

The Lodgepole Pine (***Pinus contorta latifolia***) is seldom used horticulturally. It should be, however. When not crowded (as it invariably is in its native state), the Lodgepole develops into a symmetrical and handsome tree. Its bright, yellow-

Bristlecone Pines, at Fountain Valley School, Colorado Springs



green needles and brilliant red pollen clusters make it perhaps the most colorful of the pines. Try a group of Lodgepoles in front of Austrian Pines, or Colorado Spruces. Growing more slowly than many pines, the Lodgepole can be kept in hand longer. By trimming the "candles," its period of usefulness about the small home can be further increased. It is almost never susceptible to the tip moth.

The Colorado Pinyon Pine (***Pinus cembroides edulis***) will be discussed in a later article when smaller evergreens are reviewed.

The last two native pines to be discussed are probably the most interesting of all. Both have five needles in a bundle, and both are found naturally in high altitudes. They are the Bristlecone and Limber Pines (***Pinus aristata*** and ***Pinus flexilis***). The trees are easy to distinguish. The Bristlecone has bristles on its cone scales, while the Limber does not. The needles of the Bristlecones are shorter, stiffer and a darker green. Usually exudations of pitch on the Bristlecone needles dot them with white specks. No other native evergreen has this characteristic.

Next to the Pinyon, the Bristlecone is the slowest growing Colorado Pine. For this reason, it is valuable for an informal, barrier hedge. (See picture in January, 1946 issue of **Green Thumb**.)

If happy in its location (plenty of sun, good drainage and a sandy loam), it will shoot out numerous interesting tufts that give the tree its other common name of "Fox-tail" Pine. (See picture on preceding page). As this pine holds its needles for fourteen years, it does not have the untidy fall appearance which the Ponderosa and Austrian pines exhibit.

Use the Bristlecone for unusual or picturesque effects.

The Limber is the writer's favorite native pine. In cultivation, its

needles are frequently four to five inches in length, and sometimes of a beautiful silvery cast. The Limber is a very long lived pine and at complete maturity, becomes the largest of our evergreens. The largest evergreen in Wyoming is a Limber Pine whose trunk is nineteen feet in circumference, and Colorado's largest evergreen is likewise a Limber Pine, with an eighteen-foot trunk. However, by clipping the candles regularly, a fine, compact specimen like the one shown in the picture at the center of this issue can be kept in bounds for years. Of course, on extensive grounds, it can be permitted to develop naturally and never fails to excite favorable comment.

The Alpine Fir (***Abies lasiocarpa***) and the Corkbark Fir (***Abies lasiocarpa arizonica***) conclude the list of very large native trees. Neither of these has had sufficient trial in Denver to warrant any conclusions as yet. At the writer's mountain arboretum, the Corkbark Fir has had few, if any, rivals for beauty and dependability. Its color rivals that of the finest blue in the Colorado Spruce, while its soft needles and freedom from gall aphids make it less rigid and easier to care for. The slender, spirelike growth habit of both the Alpine and Corkbark Firs, and their **erect**, colorful cones make them of great horticultural value—if hardy. They constitute an interesting experiment for the curious.

Four extremely fine exotic trees must be briefly discussed. The Eastern White Pine (***Pinus strobus***) is one of the great evergreens of the world. The magnificent specimen in the accompanying picture tells its own story. Those who have not seen the White Pines along Seventh Avenue Parkway and at Third and Downing should visit these areas at once.

The Seventh Avenue Parkway also furnishes fine specimens of the Austrian Pine (***Pinus nigra***) and the Larch (***Larix***). The sharp, white



White Pine, at residence of Mr. and Mrs. Jan Van Houten, Englewood, Colorado

buds of the Austrian Pine and its stiff, dark green needles in bundles of two make the tree a distinctive one always. It has no place about the small home, however. Its coarseness and rapidity of growth restrict its use to parkways and large estates.

The Larch however, can be used on both the small and the large estate. It is one of the two trees usually classed as "Evergreen" which sheds its needles every

winter. By cutting the new shoots in half each Spring, Mr. Frank Harris has restrained a Larch to rock garden proportions for a number of years.

The Black Hills Spruce (*Picea glauca densata*) shown on the opposite page is coveted by all who have seen it. Slower growing and of finer and denser texture than the Colorado Spruce, our neighbor from South Dakota has won a definite place in Colorado landscaping.



Sound architecture mellowed by sound planting



Black Hills Spruce, at residence of Mr. and Mrs. J. Churchill Owen

HOW TO PLAN YOUR PERENNIAL BORDER

By ALICE WOOD

PLANNING a border first on paper is the most satisfactory way of creating an harmonious and lovely picture. This does not require expert technique, and even the most informal garden needs forethought.

In our perennial borders we want succession of bloom from early spring until the frost touches all herbaceous perennials, so let us plan with that in view. On tracing paper rule off the desired area using a scale of $\frac{1}{4}$ or $\frac{1}{2}$ inch equals one foot. By using tracing paper the summer plan may be placed over the spring plan, and the fall plan over the summer one. Make a list of the plants you wish to use with their blooming dates, heights and color, taking into consideration the cultural requirements of the plants. The tallest should be in back of the border but not in one long row. Vary the size of the groups and let some come forward to meet the medium sized ones. Avoid circles and half moons. We want natural drifts of flowers after the fashion of links in a chain. It is more interesting to have bays of low plants among the taller ones and not confine oneself to low edging plants at the front of the border. An entire edging of the popular Sweet Alyssum gives too insistent a line. Consider the form and texture of the plant, and do not have too many composites together or too many spikes.

If the background is an evergreen hedge use bright colors which will stand out. Solid masses of color are much more effective than mixed. Color is a matter of individual taste, but one should avoid strange contrasts. Gertrude Jekyll in "Wood and Gardens" says, "Treat reds and yellows in graduated harmonies and the cool colors in contrasts." I quote also from Louise

Beebe Wilder's "My Garden", "Opaque white flowers are not pleasing in close proximity to strong red or blue flowers but should have an admixture of softening foliage or some inter-mediate shade. . . . Dark rich colors—garnet, purple, very dark blue, and the dark green of evergreens for they tend to lower their tones instead of heightening them."

What lovelier sight is there than Daffodils "dancing in the breeze," so plant them in drifts with a clump here and there of Phlox divaricata. The irregularly shaped groups should be so spaced that the border seems full of bloom, and yet room should be saved for those which are to follow.

May brings the Tulips, to be followed by Iris, Peonies and the gorgeous Oriental Poppies. No border is complete without the stately and beautiful Lilies and Delphiniums, the valuable Hemerocallis which thrives in sun or shade, Columbines, Lupines, Dictamnus, Platycodon, Centranthus ruber, Scabiosa, Veronica, Shasta daisies, Clematis integrifolia, Perennial Asters and Thalictrum with its graceful foliage.

Foliage plays an important part in our garden. Variegated foliage is seldom pleasing. The English use gray foliaged plants as a foil, and Mrs. Wilder agrees that "gray foliage accentuates the colors to which it is contiguous." Veronica incana is a good foliaged plant, while Iris is as valuable for its good green foliage as for its beautiful blooms. Ceratostigma plumbaginoides will always have a place in my garden not only for its deep blue flowers but also for the foliage which turns bronze in the fall.

Shallow rooted annuals may be planted over the spring bulbs for summer bloom, and when planting

Gladioli, place them near the Columbines so as to make use of their good foliage. Phlox dominates the picture during the summer months and will carry on until the Chrysanthemums add their bright colors to the scene. Plant several clumps of the valuable Cushion Chrysanthemums near the front of the border. They will begin blooming in August and will carry on the bloom of your edging plants: *Linum flavum*, *Papaver nudicaule*, *Nepeta*

mussini, *Violas*, *Campanula carpatica* and the fragrant *Dianthus*.

In a large border it is interesting to add flowering shrubs as accents. As one becomes more experienced, try bolder effects, remembering that repetition of small units is monotonous but repetition of important groups gives a strong effect. As in architectural design, one wants balance as well as interesting details creating an harmonious and charming composition.

DON'T BOTHER WITH SOURPUSSSES IN PLANTS

By M. WALTER PESMAN

If you **must** experiment with rhododendrons, try *Rhododendron hirsutum*, it thrives with a pH from 6.0 to 8.0. All of which means that it does not have to have a acid soil. Practically all the other rhododendrons do. A sour soil, or acid soil, is expressed in terms of 4.5 pH to 7 pH. Most of **our** soils run from neutral (7.0 pH) to strongly alkaline (from 7.0 pH to 9.1 pH). Only one gardener in ten knows just what pH stands for, but we all have adopted this system of expressing acidity in soils.

Different plants must have different soil acidity; Michigan State College has collected data for some 1700 plants (special bulletin 306). The results are significant for Colorado with its predominance of non-acid, alkaline soils.

All blueberries, for instance, want acid soil; so do a great many

of their relatives, such as the heaths, *Kalmia*, *Andromeda*, *Azalea*, and *Rhododendron*. We'll always have difficulty growing them in our natural soils. By the way, *Kinnikinnick* belongs there, and we all know how difficult it is.

Camellia, holly, many orchids, pitcherplants, *pyrola*, sundew, *trillium*, *linnaea* — they all start below 6 pH and seldom reach over 6 pH. It would seem like a waste of good garden energy to try and grow them.

On the alkaline side are very definitely *Mint*, *Red Pepper*, *Sugar Beet*, *Sweet Clover*, a number of grasses, and surprisingly enough such ferns as *Cliff Fern* (*Woodsia alpina* and *Woodsia glabella*), and *Cliff Brake* (*Pellaea glabella*). *Transvaal Daisy* (*Gerbera*) and *Wall Flower* have no use for acid soils.

Many of our most common vegetables thrive best in non-acid soil

No August bloom except from annuals? Then put buddleias in your border. They are available now in snowy white and all the color-range of French lilacs. Of course you do have the hardy phlox; but you might add the hardy scabiosas, both *caucasia* and *fisheri*, the improved pentstemons, daylilies, some of the pinks and carnations, and delphiniums from fall-sown seed.—Merry Mack.



THE CARE OF BENT GRASS LAWNS

By FRANK HARRIS

Frank Harris is one of those rare people who practices what he preaches. He is an expert horticulturist and landscape gardener, and yet finds time to maintain a very beautiful yard of his own, as shown in the accompanying picture.—Ed.

THE proper care of a Bent grass lawn is very similar to that required for keeping lawns of other types in top condition. The main difference is in the height of mowing and the frequency of watering. It is not as much extra work, as most people believe, but it is important to have an accurate knowledge of HOW and WHEN to do a few things if you would keep a Bent lawn continuously beautiful.

In many ways a Bent lawn is less trouble than other types of lawns as weeds are less of a problem. Because of the thick solid turf less reseeding is required and recovery from injury is faster. Unlike most grasses, Bent grass thrives on close cropping. The manner of growth is such that its spreading is encouraged and its texture made finer

by clipping as short as $\frac{1}{2}$ to $\frac{3}{4}$ inches.

After a Bent lawn is firmly established it requires mowing every four or five days in good growing weather. It is well to begin mowing as soon as there is growth in the spring and continue as late as there is any growth in the fall. If the grass should grow tall between mowings the normal height should not be restored in one mowing. Set the mower as high as possible for first cutting, repeat every day or two, gradually lowering the mower each time until the right height is reached. If this is not done the turf will show brown after cutting.

The proper watering of Bent grass differs little from that for regular grasses. More frequent sprinkling is required but the total

amount of moisture necessary to keep the grass green is no greater. Moisture is used faster by Bent grass because there is much more stem and leaf growth in the thick solid turf it produces. Except in very sandy soil, Bent lawns should not be watered every day. In extremely hot, dry weather two or three waterings per week are sufficient. For best results sprinkling should be done in late afternoon and evening. Always be certain that the faucet has been turned on from thirty to sixty seconds thus allowing all water, remaining in the hose during the heat of the day, to run out before starting to sprinkle the grass. The water must be applied no faster than the grass can absorb it because flooding is harmful to any lawn.

Bent grass makes such vigorous growth that fertilizing at regular intervals is essential to replace the elements consumed from the soil. Preferably in February or March, before growth begins, and again in September. A light coat of fertilizer may be applied in June if the grass appears to be losing color. Before the fertilizer is applied, however, it is well to spike the lawn with a Spike Roller, using the criss-cross method for complete perforation of the soil. Fertilizer

should then be applied evenly and should be washed in well with a light spray.

Bent lawns are improved by an occasional treatment of topdressing, consisting of some form of animal manure and sand decomposed together with peat or bench soil. It is advisable to topdress when the lawn is reasonably dry and best results are obtained if the lawn is mowed just before treatment.

Bent lawns should not be covered in winter with mulch or manure. It is best to let them go into the winter rather closely clipped. After a severe winter some damage may show up in the lawn in the form of spots of dead, matted grass having a rather light, bleached-out appearance. This is the result of an unusual fungus disease called SNOW MOLD, which develops only at temperatures at or near freezing and only where there is excessive moisture, such as melting snows or poor surface drainage. If the dead spots are found to be caused by insect pests such as Beetle Grubs or Chinch Bugs, which feed on the grass roots, these pests may be controlled by suffocation from poison sprays or dusts, of which many kinds may be found on the markets today.

BOOK NOTES

Alpine Flowers — 18 beautiful color plates from watercolors by Paul A. Robert. One of the Iris Books series, printed in Switzerland. The introductory text is by Prof. Carl Schroeter. Oxford University Press. \$3.00.

Geraniums, Pelargoniums — by Helen Van Pelt Wilson. M. Barrows & Co. Inc. \$2.75. "If geraniums aren't your hobby when you

begin this book, they will be when you finish it."

Arnoldia—the publication of the Arnold Arboretum, Harvard University. The May 31st, 1946 issue should be required reading for all members of the Forestry and Horticultural Assn. (Vol. 6 Nos. 4 and 5). Subject: On The History of the Introduction of Woody Plants Into North America. Author: Alfred Rehder.—Kathryn Kalmbach.

For best results plant Willow and Hackberry in the fall.—Scott Wilmore.



PARABLE

Once I saw an aspen wood
Like a cloud of flaming gold,
Holding in a light embrace
All the leaves that it could hold,
When a sudden gust of wind
Scarcely stronger than a breeze,
Swept across the valley's floor,
Rustled through the yellow trees;
And the branches, letting go
Loveliness they held so lightly

Gave their treasures to the air,
Where they whirled and glittered brightly,
Hung above the mountain's breast—
Lifted—fluttered—came to rest.
Calm and white the aspens stood;
Brave and lovely aspen wood!
Long I stood and watched the trees,
Wishing I were wise as these—
For the hardest thing to know
Is the grace of letting go.

By Mrs. Jamie Sexton Holme
From "I Have Been A Pilgrim"
Published by Henry Harrison.

The Green Thumb

November-December, 1946



A Bulletin of **COLORADO** Forestry and Horticulture

~~~~~ THE GREEN THUMB ~~~~~

A Bulletin of the

COLORADO FORESTRY AND HORTICULTURE ASSN.

Organized in 1884

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Miss Alice Wood, Assistant to the Editor

Mrs. E. R. Kalmbach, Chairman, Herbarium Committee

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Denver, Colorado

Hours: 11 to 2 — Monday, Wednesday and Friday

"To preserve the natural beauty of Colorado; to protect the forests; to encourage proper maintenance and additional planting of trees, shrubs and gardens; to make available correct information regarding forestry, horticultural practices and plants best suited to the climate; and to coordinate the knowledge and experience of foresters, horticulturists and gardeners for their mutual benefit."

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VOLUME III

NUMBER 6

FORE!

Our spelling has gone haywire again. We meant to write "Four" for this issue concludes the third unbelievable year of our reborn, or rejuvenated, or rebounding association and its lusty baby brother, **The Green Thumb**. But perhaps we did spell our title correctly, for "Fore" means "watch out" to the golfer and every other Civic Association must **watch out**, if the Colorado Forestry and Horticulture drives half as far on number four as it has on one, two and three.

Boasting?

Yes. But haven't we some license to? Three years ago the officials of an ancient but not too aggressive Colorado Forestry Association decided that the tens of thousands of eager silviculturists, horticulturists, agriculturists and other culturists in Colorado were entitled to something more active—and helpful. So the Forestry Association was made into the "Colorado Forestry and Horticulture Association," and a modest leaflet of eight pages called **The**

Green Thumb was distributed to the fifty or sixty members of the Association. Last July the 34-page profusely illustrated Central City number of **The Green Thumb** was sent to 1200 members of the Association and as many additional copies were eagerly purchased by non-subscribers. During this period, Horticultural Institutes have been held at which eminent scholars from the Universities and skilled plantsmen from the nurseries have told the members of the Association about our trees, shrubs and flowers, our soil and climate, the forests, our water problems, conservation—the live and worthwhile things Colorado's horticultural population wants to know. Plans for a Colorado Botanical Garden, which has been a "must" for many years, are under discussion; a study of needed legislation has been made; a city-wide survey of the Elm Tree Scale, with recommended protective measures, was conducted; and last—and best of all—the use, without charge, of a **separate, specially equipped headquar-**

ters has been provided by our President.

The new home of the Colorado Forestry and Horticulture Association—shall we call it “Horticulture House”—is located at 1355 Bannock Street (on Civic Center) and is now being altered to fit the Association’s needs. A botanical laboratory and herbarium, assembly room for exhibitions, lectures, meetings and institutes, offices for the Association’s horticulturist and the editor of **The Green Thumb**, and accommodations for its treasurer and assistant secretary—all solely devoted to the needs of the society—all these accommodations are in our new home.

The Future?

It is even more dramatic. George Kelly makes every copy of **The Green Thumb** more informative, more beautiful and more indispensable to every Colorado resident who has any interest whatsoever in our flora—native and cultivated. Walter Pesman has published in this issue the first installment of a manual on “Landscaping the Small Home,” which will be employed in a series of lectures being given, **free**, to Veterans who have recently acquired homes. Of course this manual will be just as invaluable to our many non-veteran members. The Denver schools are working with a committee of this Association to educate school custodians in ground maintenance and further educational and recreational outings are planned similar to the one which 125 members attended at Buffalo Park last summer.

These, in barest outline, are a few of the real treats your officers and directors are putting before you in 1947. They cannot be offered without your help, however. Increased costs, enlarged

functions and improved facilities have made more revenue indispensable. **It costs more than the present “annual” dues of \$1.00 just to print and mail the six bi-monthly issues of The Green Thumb to each one of you!** To our knowledge, no comparable magazine in the United States is put forth at less than \$3.00 a year. Your Board of Directors has recommended, therefore, that at the next annual meeting in January of 1947, the members approve an increase in dues of “annual” members to \$2.00 per year. Of course any membership renewals for 1947 received **before** the annual meeting will be at the old \$1.00 rate.

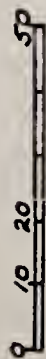
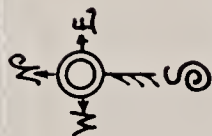
But even this increase in the dues of “Annual” members will not be adequate to do all that has been planned. **Every “Annual” member** who feels that **The Green Thumb** is especially valuable and that the **achievements** of this Association are worthwhile and merit further needed support, should convert his “Annual” membership into a “Sustaining” membership (\$5.00 a year) or into a “Patron” membership (\$10.00 a year), or “Contributing” membership (\$25.00 a year). And let every member of this Association secure for us at least one new membership. Colorado has at least 12,000 gardeners who **need** this association!

—Robert E. More.

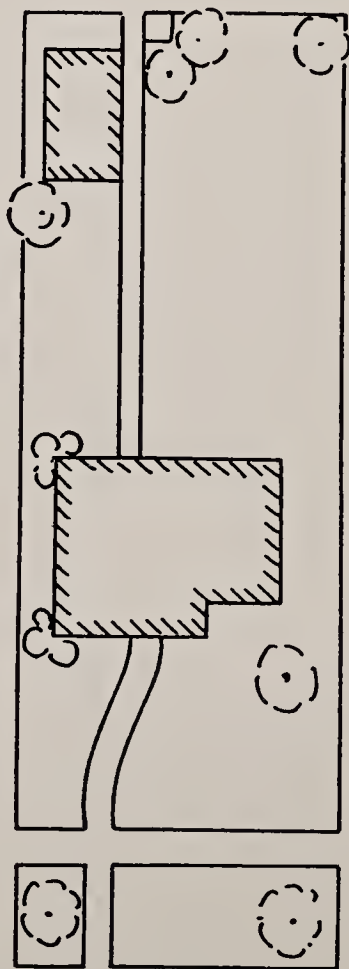
LEAFLESS TREES

Even with autumn on the bough
Far less beautiful than now,
When their frail branches hold
Skies of clear and lucent gold—
Lovelier now than in the spring—
Why should trees wear anything?

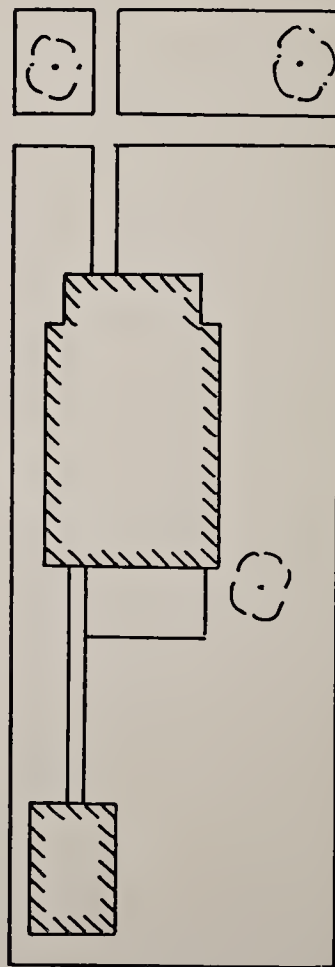
—Mrs. Jamie Sexton Holme,
From “I Have Been a
Pilgrim,” Published by
Henry Harrison.



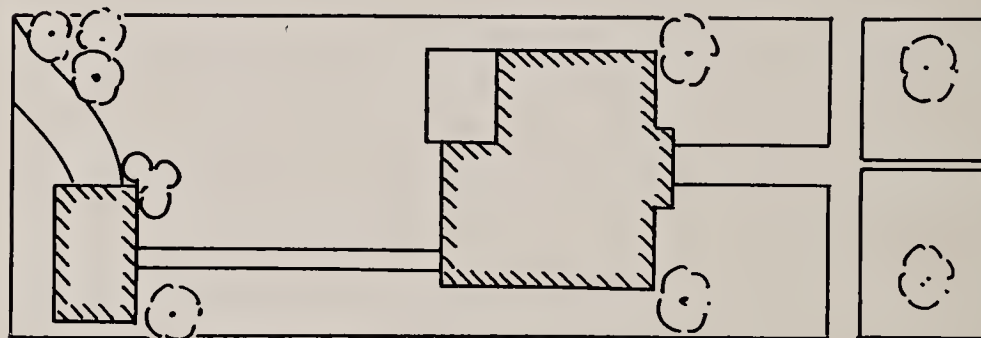
Scale in feet



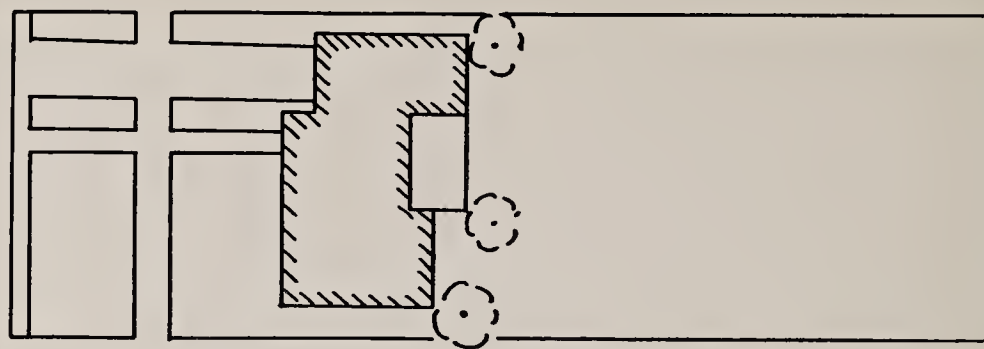
WEST FRONT



EAST FRONT



SOUTH FRONT



NORTH FRONT

LOCATION of HOUSE and GARAGE on LOT

TOPSY-TURFY GROUNDS, --OR?

M. WALTER PESMAN

TOPSY "jest growed." Home grounds should be planned first, and then grow. The result will tell.

Planning your home grounds is not difficult. But it is important to do it in time. If you don't decide just where your walks are going to be, until the cement man is there with his mixer,—you are apt to get them in the wrong place. And if you buy nursery-stock and flowers without planning what and where,—don't be surprised if your grounds are a "mess" within a year or two.

The following hints are made for the typical home ground in this region: 50 feet by 125 feet; (the "parking strip," so-called, does not belong to the home owner, but is landscaped by him anyway, so we'll include it).

You need to be an artist to make an artistic yard;—but a lot of people are artists without knowing it. If they aren't, their wives can often furnish the artistic touch while hubby watches over the practical side. And that is just as important: it is no use, for instance, to plan for gaillardias in a spot that never sees the sun, or to provide for sun-bathing in a yard with high trees along the south side. In other words, every landscape plan must have the OK from Mr. Sun. Even the location of garage and clothesline must get the sun's sanction.

Some ideas for different exposures are given in the sketch on p. 2. They are merely suggestions,—something to make us think of the importance of location if we have a chance to choose before building.

Walks and drives can be planned to be both practical and good-looking. Splitting a back

yard in two halves by a cement walk is seldom necessary, nor desirable; keep the main rear lawn open: it looks best, is easier to mow, gives an impression of spaciousness,—even to a fairly small lawn.

Here are a few practical suggestions for the location of house and garage. In general place both on the north end of the lot, so as to use all the sun you can get. (Consult the zoning ordinance to find out how far from the side line and how far from the front line your house and garage **must** be by law.)

In general one needs shade on the southwest side of the living quarters and, again in general, the strictly utilitarian items such as clothes lines, ash pit, and kitchen entrance are best northeast from the house.

Everything else being equal most of us find it desirable to connect front yard and back yard by a definite walk, even if it is only made of stepping stones.

Curved walks are not necessarily more beautiful than straight, direct ones; they cost more and take longer to follow. If they divide the lawn in two parts, they are just as wrong as a straight walk that cuts the lawn in two. Direct walks are usually best.

Whether or not to plant trees in the front parking is a question of shade and sunshine, and of privacy and neighborhood consciousness. In other words, if the whole block should have red oaks in the parking, I would certainly want to follow suit, but to rob myself of sunshine just because my neighbor likes dark rooms,—that does not seem to make good sense to me.

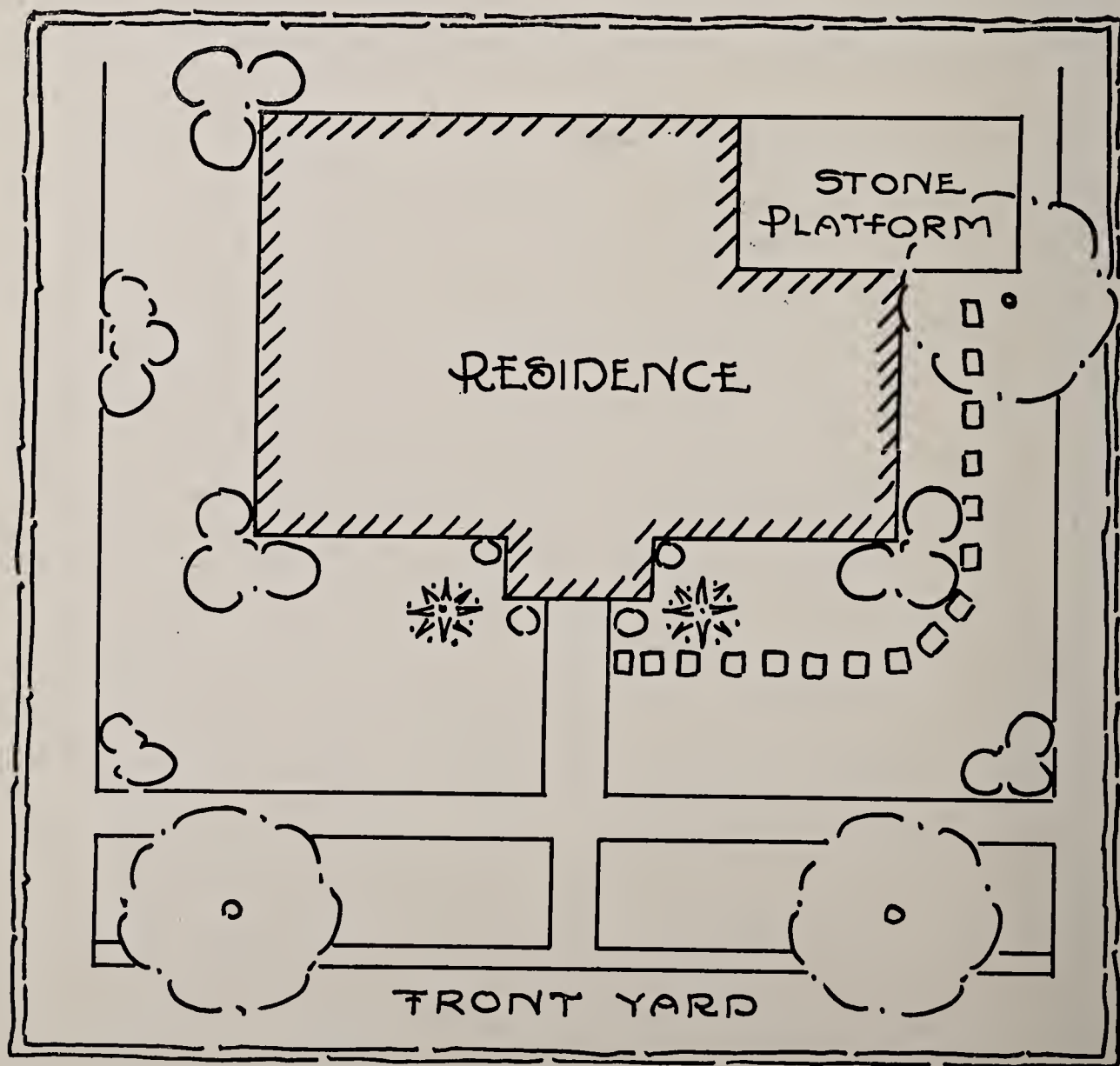
The same argument holds for

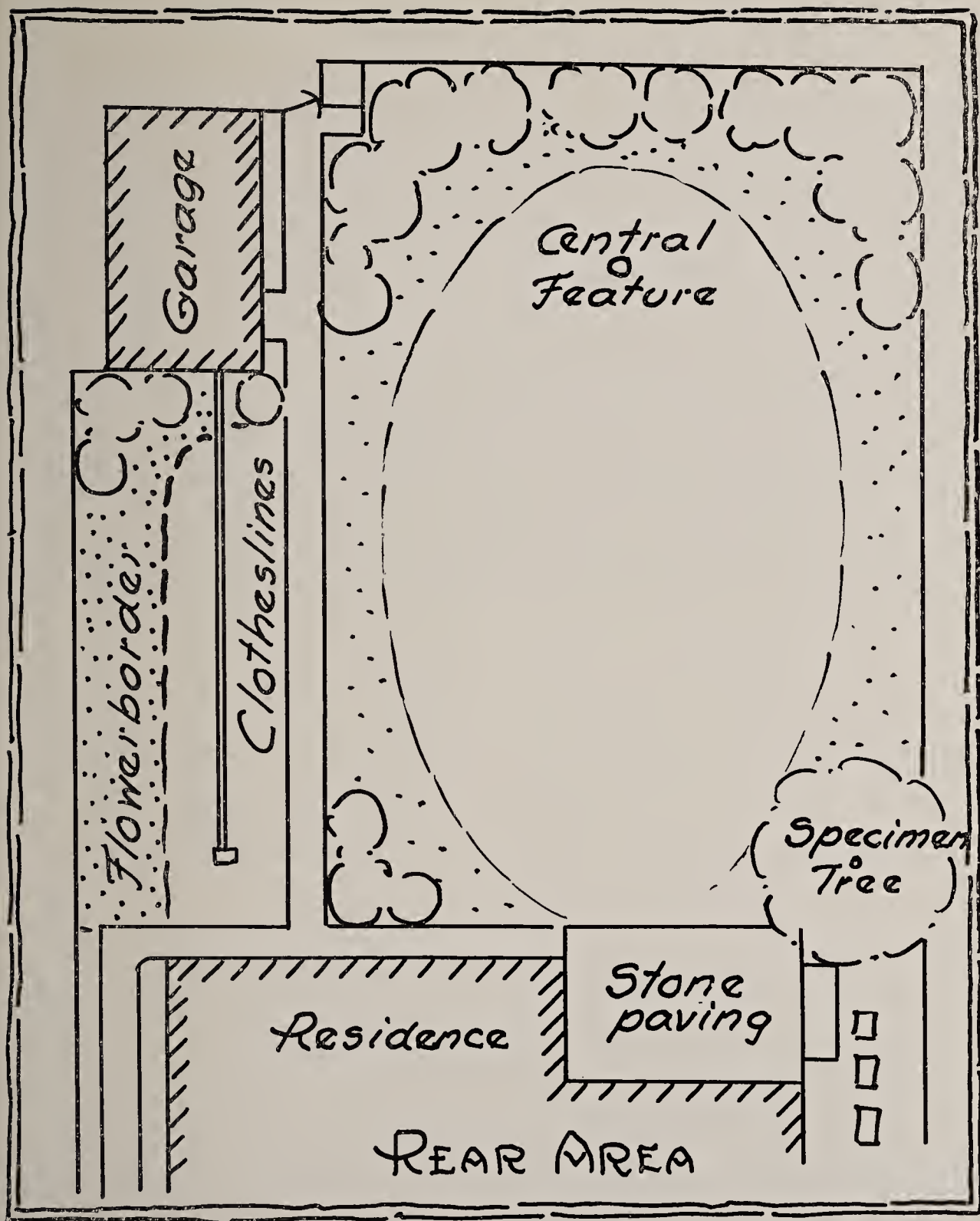
the grading of a lot. Many contractors seem to take it for granted that we want our ground as nearly level as possible. So we spend good money for grading, only to be told afterwards: "What a pity you did not take advantage of that low spot to have a nice pool," or "The beauty of a place lies in having different levels with garden steps joining them." Each home yard should make the best of its particular slope, always keeping in mind that water must drain away from the house.

There is no disgrace in having children or dogs, even if apartment house owners might intimate it. The folly lies in not

providing for them. Some home grounds have children's playgrounds, others dog-runs, others vegetable gardens and cut flower gardens. Why not? They can, (and should,) be made part of the general plan,—not stuck in afterwards, in spots where they do not belong.

On the same principle we should decide beforehand if, and where we want an outdoor fire place, a birdbath, a hammock, a wall fountain, a sundial, a rock garden, a tannery ('xcuse, I mean a sun bathing spot). Yes, and I'll admit that you have a perfect right to provide for an outdoor museum of rock specimens, if that pleases you. The main thing





is, to plan for it in time, and to find a logical place for each. And the inference is also: "Do not indulge in a whim, if you have not room for it. It is much better to have a simple, roomy lawn with a pleasant place to sit, than to try for odd fancies, that are not of lasting pleasure."

By this time I think you'll

agree, that it is best to make a list of the things you want and to draw a plan to scale so as to find out what will go in, and what won't. It may hurt you to discover that the average home ground is not large enough for a tennis court, but it saves disappointment later, if your mind is set on it without careful plan-

ning. We can do without things once we are shown their unimportance, as compared with other more desirable things.

From all this it might seem that art and good taste have little to do with the planning of a yard. Just the opposite is true: Art and good taste are of primary importance, but cannot be achieved if we do not know definitely what we have to work with. Designs vary. A sculptor's marble statue does not resemble a wood carving; pastel, oil and water-color produce different types of art, and a brick building has a different "feel" from a frame cottage.

It is not the things that go into a yard that make it beautiful or hideous or uninteresting—it is the way those things are combined and organized. Well-planned homegrounds have no odd corners left over, each part is used, each part fits in with the next part.

The view is the outstanding feature of a garden design, (call it **vista** if you prefer the high-

sounding name). The more important a view, the more carefully it should be treated. There is, for instance, the view from the main window of the living room. It should be worth framing; in fact, it is actually framed by that window. Other views are from other windows, (don't forget the kitchen window!). Then most of us want the view of the house from the street and sidewalk to be an attractive one. As with a portrait, the full-face view is much less important than the three-quarter view.

How to create a pleasing vista? It is not at all difficult. In general it is well to have a view framed by one or two trees, placed at the sidelines of the "picture." The center should be kept uncluttered; a piece of lawn is always restful. A rather quiet background, an interesting middle ground, a central feature to catch the eye,—there are the components of your composition. Usually the simpler designs are the more attractive ones.

"Central features" can be of

A Garage Does Not Need to Be Homely





A Pool and Arbor Should Be Fitted Into the General Design

many types: a birdbath or seat is quite apropos in a garden; gazing globes or carefully selected sculpture may be just the thing; an arbor, pergola, or outdoor fire place can be used as a "focusing point". Specimen trees or shrubs are more difficult to use as centers of attraction; strangely enough it seems to be the combination of man-made and nature-

made objects that strikes us as "just right." Check up on this in your favorite garden pictures; almost all have a "humanized" central feature.

"What shall I do about my neighbor's ugly garage?" "How can I screen out my clotheslines and ashpit?"—Well, tall shrubs and vines can do wonders in that respect. Our next number of the

Private Garden of Mr. and Mrs. Geo. H. Garrey



"Green Thumb" will give a list especially for home use. The January-February number had a very complete enumeration of hedge plants, both for formal and informal use: all can be used for screens. Remember that the evergreen kinds are doing the better job, since they screen both in winter and summer. Of course, they are more expensive.

Oh, yes, expense! The average home-owner must watch the pennies spent on the grounds,—especially if the building contract has exceeded the original estimate and budget (and doesn't it always?)

Well-planned home grounds are the economical ones. Why? Because each plant is bought and

placed with the definite location in mind, and does not need to be moved when the next whim strikes. A five-year plan can be drawn up, with so much spent each year, completing the picture as it is carried out in detail.

Well-planned home grounds give anticipated pleasure, as does any piece of art, while being composed and executed. One gets fun in visualizing the garden, in carrying it out, in seeing each part grow up.

And, incidentally, a well-planned garden increases value of your property by a nice little sum. Topsy-turfy grounds have no sales appeal.

So, good luck, new home owner!

TWO NEW BOOKS

I have just acquired two new books that I believe many of my friends will appreciate.

One is the "Gardener's Bug Book," published by The American Garden Guild, Inc., and Doubleday & Co. This is a book of 590 pages, written by Cynthia Westcott and edited by F. F. Rockwell.

We quite agree with them when they say of it: "The Gardener's Bug Book brings to the home gardener for the first time a manual on insect pest control that is scientifically accurate and which also presents its subject in such a simple manner and so lucidly that any layman can follow it. It is difficult to conceive of any gardener, no matter how small a place he may have, who will not actually save several times the cost of this volume during the first few months he possesses it."

The other book is "A Few Brass Tacks," by Louis Bromfield. Whatever you may think of his political, economic and social ideas, all good horticulturists will agree with his views on the importance to the nation of agriculture and horticulture, and that natural resources and work are the only producers of real wealth.

This book is one to read and talk about. The first book is to be referred to when some new bug invades your garden.

Another very valuable bulletin has recently been published by the Colorado A. & M. College at Fort Collins, Colorado. It is entitled "Diseases of Ornamental Plants, written by Junius L. Forsberg. It contains 172 pages with many illustrations and is attractively bound.

GEORGE W. KELLY.



FERNS HARDY IN COLORADO

By HELEN K. FOWLER

**Of the Thousands of Species Known Today, a Very Few
Only Are Dependable Here.**

WE'RE high and dry in this section of country and ferns generally have no fondness for dry places. They like to live where the air is lush and humid but their immense variety makes it possible to select kinds adapted to almost any location—a dozen or less species might be the answer here,—however these meet with our shade requirements for such specific uses as general borders, rock and water gardens, driveways, parkways and many odd places.

The Ostrich and the Lady ferns are exceptionally tough here and they possess an elegance not surpassed by any of our flowering plants. The Ostrich is one of our best. Since it increases by underground runners, it soon forms dense growths of almost tropical

**In the Entrance From the Gate Below the
House Terrace of Dr. and Mrs. Kenneth
Sawyer. Ferns, Windflowers, Anchusa and
Polemonium**



**Terrace After Terrace Bordered With
Ferns and Their Many Companions for
Shade—Garden of Mr. and Mrs.
John Evans**

luxuriance; then, too, it is one of the two or three that lends itself to conditions of the general border where we are constantly having more and more respect for foliages.

The shady parts of our garden give us lots of trouble. Jumping way back, this concern might have been necessary when many a fine tree was sacrificed for mass bloom, when those quiet spots were neglected as part of the garden development. We know

**In the Arthur Bosworth's Garden, at Top of
Opposite Page—a Sympathetic Group of a
Statue, with Ostrich and Colorado Male
Ferns in the Play of Jetting Water.**

**Lower Picture—Pool with Ferns and Vinca
Minor Fronting the Brick Summer Home of
the W. E. Porters**



better now. We recognize that flowers are but incidental to the plan and that ferns and other shade-lovers may reclaim those waste places.

The Maidenhair (*Adiantum pedatum*) is also very hardy in Colorado. It probably is more appreciated than all of the other ferns put together. Strangely enough it is being confused constantly with other plants that are not even ferns. You will often have the Columbine, the Baneberries and the Meadow Rue pointed out as the aloof Maidenhair. We use the Cinnamon and the Christmas ferns (*Osmunda cinnamomea* and *Polystichum acrostochoides*) with great dependability in both Denver and Boulder gardens but the Hay-scented (*Dicksonia punctilobula*) I do not exactly know. When it fails to grow it may be our own fault. It grows well here in our shade house where there are tons of peatmoss used. None of the ferns here seems so much at home as the Bracken, the chief characteristic of which is strength and coarseness. It creeps for long distances and can be moved only when dormant. It turns brown in autumn but does not wither away until the following year. I like its looks but I never use it. And now the Colorado Male (*Aspidium filix-mas*). It is a beauty from early spring until late fall. If you must have but one fern, this should be it.

We are trying out three low-growing ferns, from 2 to 8 inches, the right height for some particular places. Of course no fern should be allowed to dry out in the winter time but special attention must be given to these. They are growing well now but they must go through a lot yet before we can pass on them.

They are:

The Winged wood fern (*Dryopteris hexagonoptervis*)

The Beech Fern (*Phegopteris heragonopteris*)

and the common Woodsia (*Woodsia obtusa*)

I have travelled the roads of Denver for the past weeks trying to secure some sort of a fair index of the fern gardens—the camera has caught a few lovely spots here. In the select gardens of Mr. and Mrs. Mason Lewis the Colorado Male has been planted on three sides of the tea-house in the south end of the gardens. The Siberian Forget-me-not has been added and the spring should be especially pretty there with its English Primulas, yellow and white. The Jan Van Houtens' new terrace has a border of ferns, *Funkia* and *Saxifrages*. Surprisingly too the white Phlox, *Mia Ruys* is there with many more shade plants—all just a touch in their characteristically charming gardens. I visited many places in the process of construction with a date for ferns. In the unusual terraced gardens of Dr. and Mrs. J. B. Walton is a 25-foot border under elm trees. Ferns are to be massed here with Japanese *Anemone*, the two Baneberries, *Shooting Stars*, and *Mertensias* with a margin of *Phlox divaricata* and *Wake robins* for spring. Mrs. Roger D. Knight has a new terrace under an old apple tree; with a pool and a stone seat, the very place to read, sip refreshments or 'just sit'. Ferns are to be grouped all around the stone, with *Philadelphia Lilies* and *Hepaticas*. The brick wall, the attractive brown gate and the proximity to the house all unite to make a thoroly pleasurable bit of garden.

TRANSPLANTING: Herbert Du-rand who has devoted many years

At Top of Opposite Page—A Group of *Woodsia* in a Specially-preferred Green Border of Dr. and Mrs. Malcolm G. Wyer

Notice the Many-colored *Begonias* Grouped With Masses of Ferns in the Long, Shady Borders of Dr. and Mrs. Leonard Van Stone, Sherman Park, Denver



to the study and the experimental cultivation of ferns has this to say, "My experience has been that ferns can be transplanted successfully any time during the growing season . . . it is a matter of disturbing the roots as little as possible, keeping them moist and protected from the air and sun until the plants are established in their new homes. This has been our experience for years—this last July Dr. and Mrs. Leonard Van Stone, themselves, moved hundreds into their garden (pictured here) in full growth—you should see them—they are only a part of a beautiful garden picture.

For those who wish to read and study ferns, there is a list of books attached, furnished by Mrs. Wyer, wife of our city librarian, Dr. Malcolm G. Wyer.

COVERING: We never cover our ferns. They protect themselves. Their only covering is made by the dying of their own fronds, which naturally fall away from

the center of the plant, cover the surrounding soil, but leave the crown of the plant uncovered and unhindered to start off in the spring.

SOIL: Ferns like a well-prepared bed incorporated with plenty of humus, peatmoss, sheep manure, or leafmold. Do not drown them one day and then run off to the mountains for a week end. Keep constantly and evenly moist, bearing in mind that soil stagnation comes easily in dark places.

The Fern Allies—Willard N. Clute
Ferns in their Haunts and Ours—

John Robinson

The Fern Collectors Handbook—

Sadie Price

How to Know the Ferns—

Frances T. Parsons

Plants of the Rocky Mountain National Parks

Wild Flowers and Ferns—Herbert Durand
Flora of Colorado—Rydberg

American Ferns—Roberts and Lawrence

Our Native Ferns—Prof. L. M. Underwood
—"A complete but coldly scientific work"

Parsons and Clute's Books "Both are written in non-technical language and refer to culture only in the most casual way"

FOUR GOOD TREES FOR COLORADO

BY SCOTT WILMORE

It is the writer's opinion that one of the most overlooked trees for Colorado plantings is the Thornless Honey Locust. Few insects ever attack this tree; about the only one worth mentioning being the Red Spider. Other than the above, it is practically insect free. It thrives and grows under the most trying conditions, on either extreme of wet or drought, and pretty generally takes care of itself if given any chance at all. I consider it one of the most useful, as well as graceful of all the trees common to this locality. There should be more of these trees planted than there are in the Colorado area.

Another tree of great merit is the male Cottonwood, commonly referred to as the cottonless va-

riety of Cottonwood; especially is this true in the rural areas, where one desires a quick growth and where it has plenty of room to expand and shift around for itself so to speak. They will thrive under the most trying of conditions, and even though attacked by insects, seem to be able to survive any attacks of this nature. A further asset of this tree is the fact that it is very long lived and contains all the characteristics of the old line Cottonwood, except that one does not have to put up with the nuisance of the cotton.

The American Linden is another tree very much overlooked, especially in city plantings, more especially as a parking tree. While the European Linden is perhaps, in the writer's opinion



Cottonwood Tree in Washington Park, Denver—Photo by Edgar E. Warren

at least, a more beautiful tree, yet it does not transplant as readily, nor does it grow as fast as the American Linden. It is practically insect free, and while trimming is advisable occasionally, it will practically take care of itself in this respect.

Personally I love the Oak family, more especially the Red Oak. In the east and other localities, the Pin Oak is considered "tops," not only in the Oak family, but also in comparison to other trees. However in our Colorado area, it has been my experience that the Red Oak causes far less

trouble and transplants more readily than any of the other Oaks; especially where chlorosis enters into the picture. Very few Pin Oak are free from chlorosis, whereas very few of the Red Oak suffer from this disease. Where chlorosis develops on Oak or any other trees, a little prompt attention with magnesium sulphate or iron sulphate treatment around the roots, will shortly bring out the green leaf feature again. To me, a well grown and well taken care of Red Oak is the last word in what one would want and expect in a deciduous tree.



Linden Tree in Civic Center, Denver —Photo by Edgar E. Warren

On Opposite Page—Red Oak in Sloan's Lake Park, Denver
—Photo by Edgar E. Warren



DORMANT SPRAYING

BY PAUL N. MORROW

Grounds Foreman and Horticulturist for the Denver Public Schools

Here is information on one of the most important subjects with which a Forester or Horticulturist should be concerned, written by a man who knows.—Editor.

SO LONG as man and insects need the same things for existence, injurious insects will constitute man's greatest threat to survival. Concern over this fact has caused much study and experimentation, which has enabled man to strike at the insects' most vulnerable spots. From this effort we have learned much about their habits. We now know what, when and how they eat; that usually the plant of their abode is also their food supply; that most insects are inactive in cold weather; that they pass through the winter in one of three states: egg, young or mature; that trees can take a more concentrated spray solution while dormant, without injury; and that a dormant spray can be more easily applied, assuring better results. All of this indicates the importance of dormant spraying.

The insects for which we normally do dormant spraying are European Elm Scale, Cottony Maple Scale and Oyster Shell Scale. Dormant spraying will also help to control other scale insects, aphids, red spider and spruce gall.

The European Elm Scale spends the winter as second instar nymphs. It is unarmored and is found in great numbers on the underside of limbs, in the small crevices on the bark and is protected by coverings secreted by the insects themselves. These winter forms are light gray, about as large as the head of a pin. The mature form in summer is almost a quarter of an inch in diameter

and cottony underneath. It attacks all elms but is more numerous on the American. These insects weaken and kill trees by the constant sucking of the sap. The trees become black and unattractive from the dropping of the honeydew secreted by the young scales. It also smuts walks and benches, and attracts thousands of flies, wasps and ants.

The Oyster Shell Scale differs from the Elm Scale in that it has armor and goes through the winter in the egg stage. From fifty to sixty eggs will be found under each armor, which constitutes the remains of the mother scale. The eggs hatch in June and July. In appearance they resemble tiny oyster shells. Oyster Shell Scale is a real killer on a variety of trees and shrubs, especially ash trees, lilacs, cotoneaster and dogwood.

The Pine Scale has a life cycle similar to that of the oyster shell. They remain attached to the needles and gradually suck the life out of them causing them to fall. They are especially bad on pine and spruce. In size they are about as large as the head of a pin, and are white.

The Cottony Maple Scale has a different life cycle. Only mature females pass through the winter as small brown scales. In the spring when the sap starts flowing, they grow very fast and start laying eggs which are secreted in cotton like masses of wax under the mother scale. Each female lays from fifteen hundred to three thousand eggs which hatch



Cottony Maple Scale

around July first. The accompanying picture shows them about natural size. At one time they were very numerous in Denver but all mysteriously disappeared one winter. Recently they have been found in South Denver on maple, honey locust, horse chestnut and even on elm.

Red Spiders pass the winter as adult females on various wild and cultivated plants, usually evergreens or hardy perennials. They

are very tiny insects difficult to see without a glass. They are active through the winter except during very severe periods. I have removed infested twigs from Juniper trees on very severe days in January to the inside where it was warm and in a short time there was much activity among the spiders. The female spider does not start laying eggs until warm weather. A dormant spray applied before this time is very ef-

fective in controlling them. Whenever the food supply of the Red Spider runs short it starts migrating. In such a case, the benefit of all sprays is only temporary.

While all the above mentioned insects vary in their life cycles, they are very vulnerable to good dormant spraying. Trees and shrubs in their dormant stage can take without injury insecticides of sufficient strength to destroy the eggs or kill the insects. Sprays can also be applied during the dormant period without injury to beneficial insects and disturbance to the biological control of the injurious ones. This is an important consideration.

Dormant spraying must be of a contact nature and possess either a dehydrating or penetrating

quality. Lime sulphur and miscible oils have filled this need very effectively. A good fast breaking oil properly emulsified has become most commonly used for dormant spraying of deciduous trees. A good emulsifying agent added to the properly selected spray oil causes the oil and water to flow freely together in a rather stable solution requiring very little agitation. Oil spray in this stage assumes the appearance of milk. The water acts as a carrying agent and permits a smooth even distribution of oil over the entire tree. The emulsifying agent comes into the picture again at this point causing the spray to adhere to the surface of the tree and waxy-covered insects, and it also aids penetra-

Typical Damage From Elm Scale



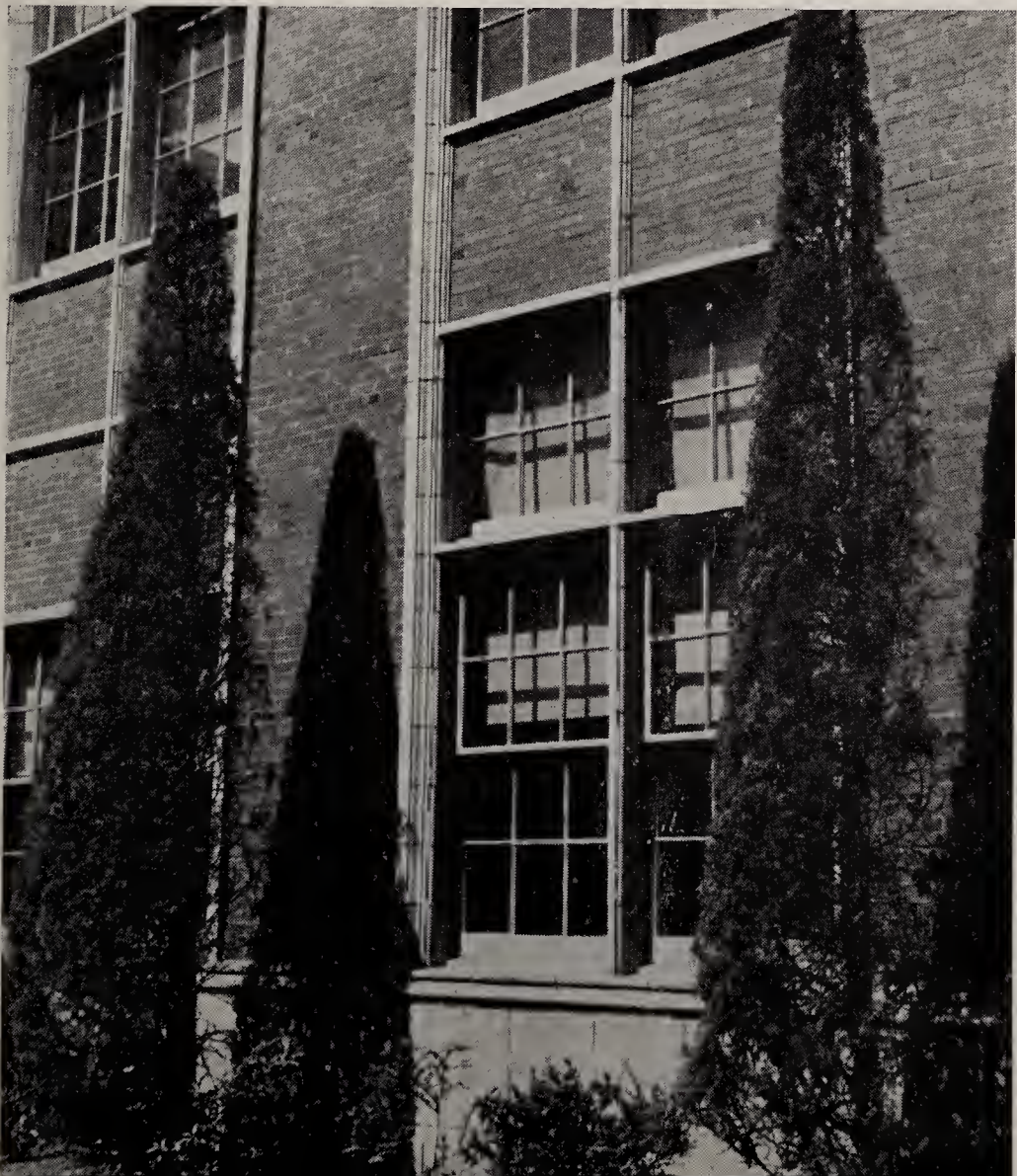
tion. Oil sprays are also used on evergreens but in a very much weaker solution. Lime sulphur remains the most commonly used spray for evergreens. It has some disagreeable qualities such as bad odor, caustic action to skin and eyes of spray operator, and the staining of paint and masonry work. Sprays used on evergreens at dormant strength must be applied before the appearance of new growth.

The method of application of this material is as important as the materials themselves, the chief factor being a proper mixture thoroughly agitated and used with sufficient pressure. The ratio of mixture varies according to the insect involved and the trees to be sprayed. Pressure sufficient

to break spray into a fine fog-like mist is necessary so that all parts of the tree are thoroughly covered. This usually requires four hundred or more pounds of pressure. Time of application is also important. This may be in fall or spring, when the leaves are off, when the weather is likely to remain above 40 degrees for several hours and when there is not too high a wind.

With all these difficult factors to consider, the best guarantee of effective spraying is the knowledge and honesty of the sprayer. I realize that dormant spraying is not a "cure-all," but it controls more different kinds of insects with one application than any single spray applied at any other time.

Below—Typical Damage Caused by Red Spider



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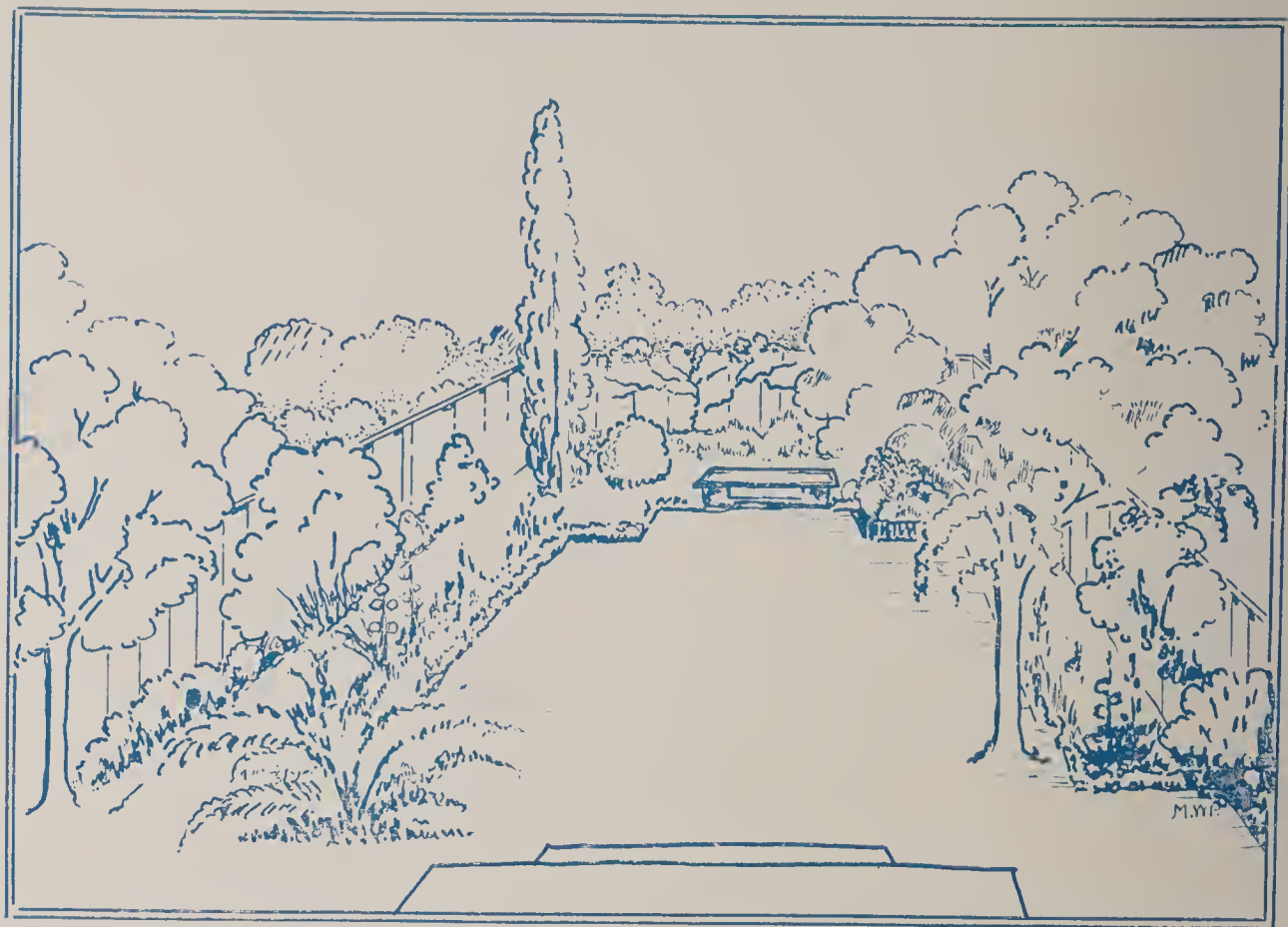
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KOSTER BLUE SPRUCE

Our beautiful cover this month has been made possible through the generosity of the D. Hill Nursery, of Dundee, Illinois. We have been promised, in addition, 10 other equally beautiful illustrations in color, all taken from L. L. Kunlien's book, "The Friendly Evergreens," which has just been published by the D. Hill Nursery Company. ("The Friendly Evergreens" will be in the new library of The Colorado Forestry and Horticulture Association.)

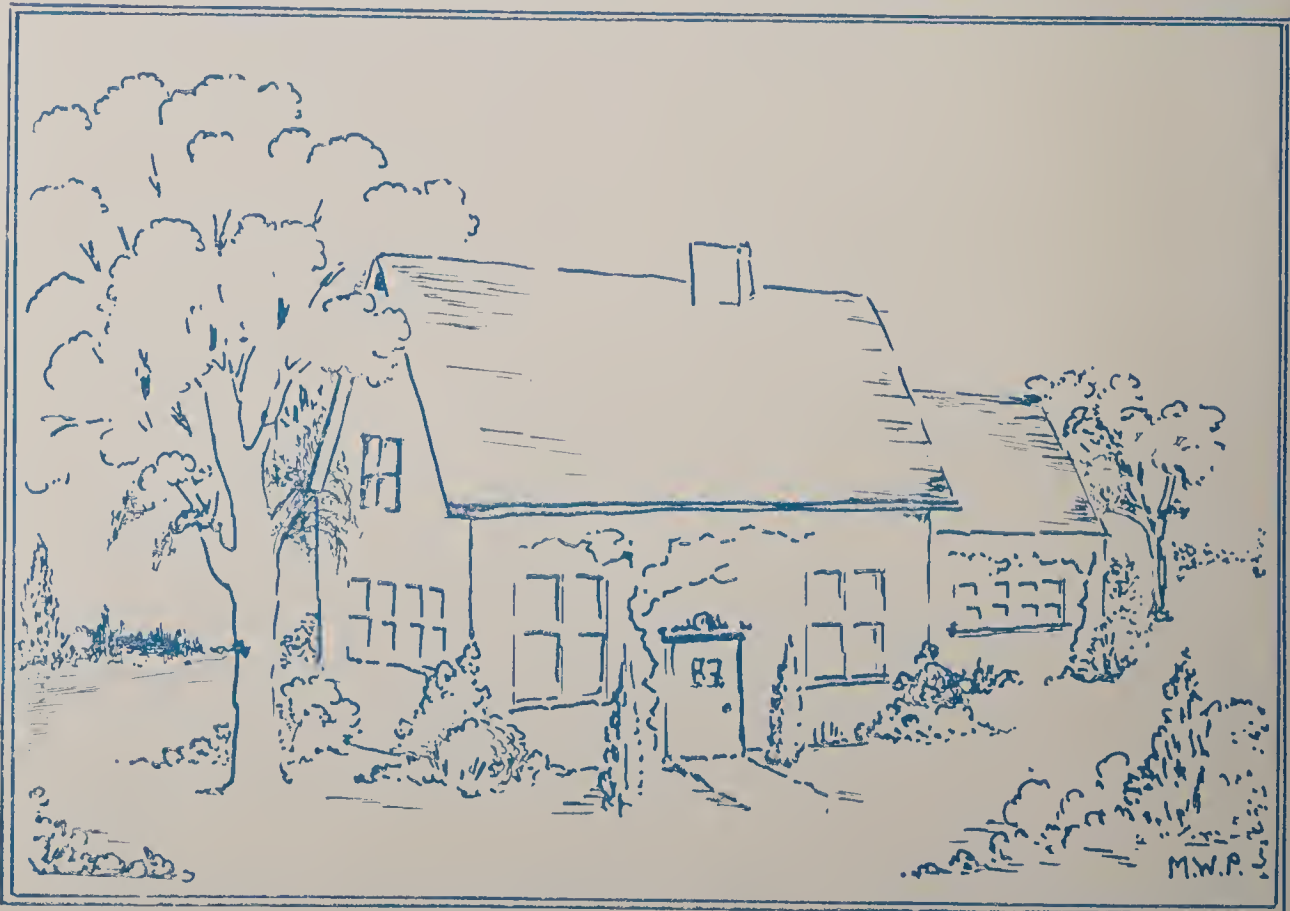
On behalf of the **Green Thumb** and all its readers we thank the D. Hill Nursery Company and its president, Mr. Arthur H. Hill.

The Koster Blue Spruce is one of the most famous and beautiful trees in the world. It is a graft from our own Colorado Spruce (*Picea pungens* var. *kosteriana*, Hort.)



Privacy Is Essential in the Rear Yard

Not Too Much and Not Too Little in the Foundation Planting





~~~~~ THE GREEN THUMB ~~~~~

A Bulletin of the
COLORADO FORESTRY AND HORTICULTURE ASSN.

Organized in 1884

George W. Kelly, Editor

Miss Alice Wood, Assistant to the Editor

L. C. Shoemaker, Office Manager

Room 17, 1608 Broadway — Phone TAbor 3410

Denver, Colorado

Hours: 11 to 2 — Monday, Wednesday and Friday

"To preserve the natural beauty of Colorado; to protect the forests; to encourage proper maintenance and additional planting of trees, shrubs and gardens; to make available correct information regarding forestry, horticultural practices and plants best suited to the climate; and to coordinate the knowledge and experience of foresters, horticulturists and gardeners for their mutual benefit."

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VOLUME IV

NUMBER 1

HORTICULTURE HOUSE

ARTIST Lester Varian has shown on our cover this month how the new home of the Colorado Forestry and Horticulture Association will look when contractors Brown and Schrepferman finish the remodeling designed by Architect Lester Varian. As shown by the plans on page 25, **Horticulture House** will have an apartment upstairs for Treasurer L. C. Shoemaker and Mrs. Shoemaker, an office downstairs for Mr. Shoemaker, an office for Mr. Kelly in his dual capacity of Horticulturist of the Association (see following announcement) and Editor of **The Green Thumb**, and a large room that will serve both as a library and meeting room. In the basement will be facilities for an herbarium of Rocky Mountain plants, and for a botanical laboratory. Mrs. G. R. Marriage has made a landscape plan for the premises which is shown on page 2 — and the nurserymen listed below have donated the material and labor called for by Mrs. Marriage's plan.

Mrs. Helen K. Fowler has made and secured donations of money

and books that assure us the outstanding horticultural library in the Rocky Mountains. Dr. Malcolm Wyer, of the Denver Public Library, has promised us every assistance possible.

Mrs. E. R. Kalmbach has been put in charge of the Herbarium and she solicits plant material from all members.

These are some of the facilities that will be afforded by our new home. As soon as building conditions make it possible to complete the extensive remodeling that is now under way, a general meeting of the Association will be held at **Horticulture House**.

We thank the following nurseries for generously offering to donate material and labor.

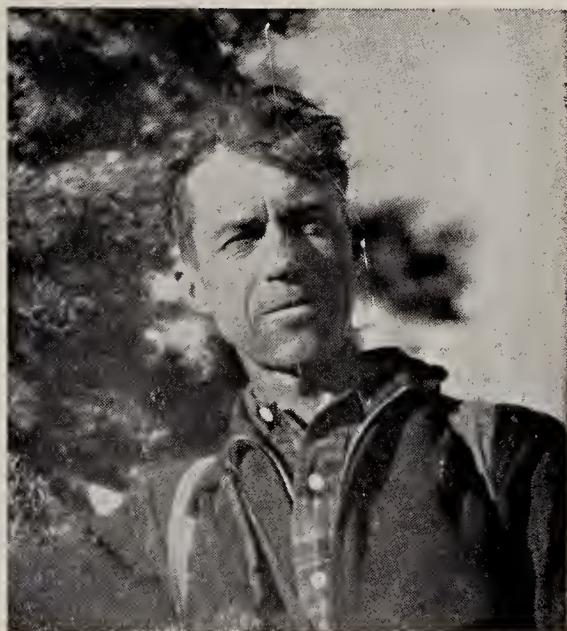
Alameda Nursery, Inc., Denver; Amidon's Cash Nursery, Denver; Arapahoe Acres Nursery, Littleton; Colorado Gardens, Colorado Springs; Glenmore Nursery, Denver; Green Bowers Nursery, Denver; Hartschen Nursery & Landscaping Service, Cheyenne; Kroh Bros., Loveland; Littleton Nurseries, Littleton; Marshall Nurseries, Denver; Oakesfield Nurseries, Wheatridge; Roberts Nurseries, Littleton; Upton Gardens, Colorado Springs; W. W. Wilmore Nurseries, Wheatridge; Williams Gardens, Greeley; Roy E. Woodman & Bros., Denver; St. Vrain Valley Nursery, Longmont.

GEORGE W. KELLY EMPLOYED AS FULL TIME HORTICULTURIST OF COLORADO FORESTRY AND HORTICULTURE ASS'N

Our president, Mrs. John Evans, has authorized us to state that Mr. George W. Kelly has been employed as full time Horticulturist for the Colorado Forestry and Horticulture Association. Mr. Kelly's achievements as Editor of **The Green Thumb** are known to all our members. He will continue to act in that capacity and will, in addition, spend 4 hours each week day at **Horticulture House** (the Association's new home at 1355 Bannock Street) promoting and coordinating all activities of the Association.

Among other things, it is planned that Mr. Kelly will perform the following services for our members and for the public:

Arrange for seasonal exhibits at **Horticulture House**; collect and disseminate publicity on current horticultural topics; be available each day at **Horticulture House** to furnish horticultural information; give talks to Garden Clubs and other similar organizations; help collect and identify specimens for the Herbarium; promote horticultural demonstrations; cooperate with all horticultural and forestry agencies in Colorado; render assistance, when requested, to the schools, churches and all public and civic agencies.



A brief description of our new **Horticulture House** is given in another place. It is confidently believed that the facilities of our new home, together with the services that will be performed by Mr. Kelly in his new position, will open a greatly expanded era of forestry and horticulture in the State of Colorado.

Again we proffer our sincere thanks to our President, Mrs. John Evans, for making available to the Association our splendidly adapted new home on Civic Center. And to George Kelly we extend congratulations and best wishes in this new work he is so admirably fitted for.

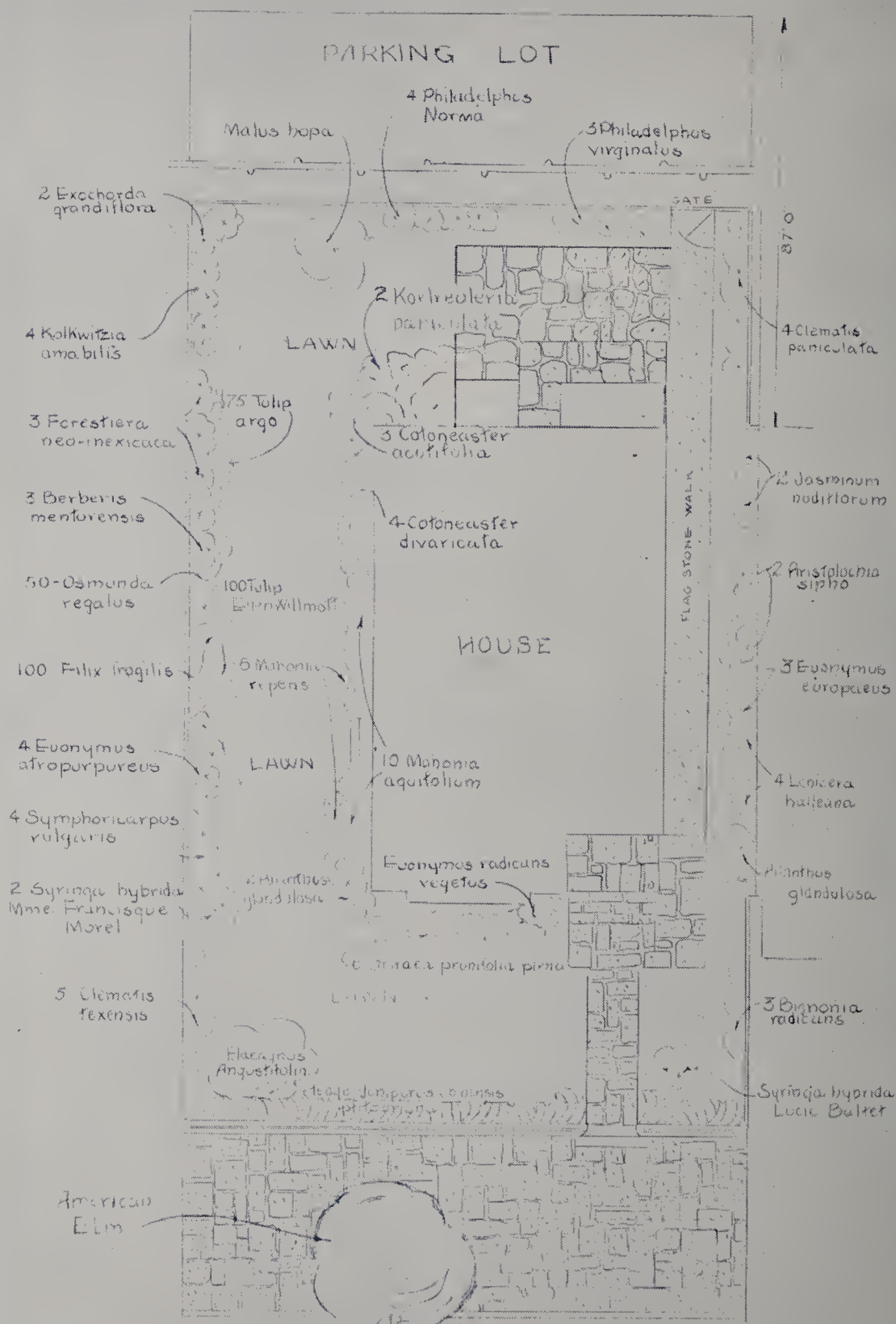
ANNUAL MEETING JANUARY 27

Tentative plans have been made for our annual dinner meeting to be held January 27 in the Chamber of Commerce dining room, 1726 Champa street, Denver. In addition to the dinner at 6:30 p.m. there will be an Horticultural "Information Please," and Mr. Harold Roberts will show some of his wonderful kodachromes of native wild flowers.

Send in your horticultural questions for submission to the experts. Address to the office, 1608 Broadway, attention James S.

Holme. Further details will be mailed to each member later.

Make an effort to get your own renewal and new memberships for your friends in before this date, as after that time the annual memberships will be \$2.00. If you believe that we are doing a worthwhile work back us up by securing additional members. We can continue to improve our magazine and other services if we are supported by a rapidly increasing membership.



PLANTING PLAN FOR FORESTRY & HORTICULTURAL ASSOCIATION HEADQUARTERS

Prepared by MRS. G-R. MARRIAGE - L.A. COLORADO SPRINGS, COLORADO

SCALE 1" = 1'

HORTUS SICCUS

WHAT is it? Why, literally, "a dry garden," better known as an Herbarium, a collection of dried plants. And we are to have just that at our new headquarters building. Yes, we are to have an Herbarium for the use of members and visitors to Colorado. Now perhaps some of you are asking why we need an Herbarium. The Colorado Forestry and Horticulture Association needs an Herbarium just as it needs a Library and all other reference material for the use of our Colorado citizens. Very often the Herbarium is the only means of positively identifying a species of plant, tree, or shrub. Books we must have, and to supplement their information, we must have specimens for comparison and identification. No botanist can depend upon the printed word alone. If indeed, this had been done, we would never have had new species described, for each

year adds to our knowledge of our local and national flora.

But an Herbarium is not for the use of Botanists alone. When even the least of us fares forth and returns with some new form (at least new to us) of plant life, we should be able to find out what it is, and in this the Herbarium can be a very real help.

We are fortunate in having the promise of some rare historical specimens, as well as a number of those more recently collected by various individuals, and we hope to add steadily to this small beginning.

The largest Herbarium between the Mississippi and the West Coast is the Rocky Mountain Herbarium at Laramie, Wyoming. We are open to suggestions for a name for our infant Herbarium—a name we hope to make known to the world in the years ahead.

Kathryn Kalmbach.

UNITED HORTICULTURE NEEDED

American interest in gardening is expanding in the amateur field, while the scientific and cultural phases of horticulture, as well as its economic and social aspects, are becoming more important than ever. These trends seem destined to continue.

With this development has come diversity of interest. Areas of limited scope have lost touch with one another. Although many special groups are contributing significantly to the horticultural life of the nation, there are times when the combined force of all is needed if horticulture is to receive proper recognition. History reveals the essential role of gardening in human civilization. Present day horticulture suffers from lack of perspective and lack of unity. Until its fundamental importance is fully recognized, many of its benefits cannot be re-

alized. More specifically, there are several practical ends which concentrated effort could achieve for the good of all.

—American Horticultural Council.

A Free Landscaping School offered by the Colorado Forestry and Horticulture Association is in the making. It is being visualized primarily for returned veterans who are now establishing new homes. If there is an expressed desire for non-veterans to be allowed to attend, the Association may change its original plans. As planned now the classes will be held at the Evans School at West Eleventh and Acoma.

In response to returned postal cards from veterans the time has been set for February, 1947. More information will be given later.

M. Walter Pesman.



A WELL PLANTED YARD

Home of Mr. and Mrs. Middleton Stark, La Junta, Colorado

PLANTS TO USE FOR LANDSCAPING

By GEORGE W. KELLY

The principles of good design are much the same the world over although different features may be preferred in various localities. When it comes to the plants needed to execute a plan, however, we find that there is a wide variance in the material which is suitable to use. We have peculiar climatic conditions in Colorado, and in most of the mountain and plains states which necessitates the use of much different material from that usually used in the East, South or West Coast areas.

Many of the beautiful plants shown in the catalogs of the large nurseries are not suitable for use here. We have a short season in

our state, with erratic springs and falls. We have usually little moisture in the soil or air. We have much dry sunny weather in winter, and we have in most populated places a definitely alkaline soil. Only those who have had years of experience with plants in this area are competent to advise as to varieties to use here.

We will not attempt in this issue to refer to ALL the suitable plants for use in Colorado landscaping, as we have given rather complete lists of various classes of plants in past issues, and we plan to give additional lists in future issues.

TREES

TREES form the backbone of any ornamental planting. They are planted to provide shade, background, framing and as specimens. For each purpose a different type of tree might be suitable. A framing or "street tree" should be high-headed and usually of symmetrical habit of growth. Specimen trees may be low-headed or of small, slow-growing kinds; and may be selected for some special feature such as flowers, fruit, fall color or beautiful shape.

If a plan can not be completed the first year, the trees should be put in first, as it takes many years to grow a good tree, while a good effect can be obtained from shrubs in a couple of years. It is usually most practical to plant a tree of about two or three inches in diameter. If larger trees than this are used they will be slow to commence growth, and if smaller ones are used it will take extra years to produce a sizable tree.

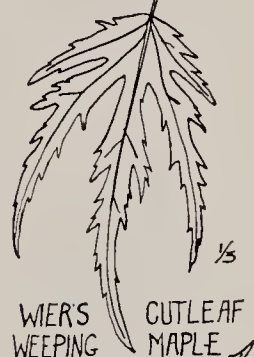
In selecting a tree you should consider its ultimate size, shape, freedom from pests and diseases and its adaptability to our climatic conditions. The better trees are all rather slow growing. If you must have quick results and plant the "weedy" trees such as the willows, poplars and Chinese elm, you will find in a few years that they are overgrown, diseased or broken and you will have to take them out and start all over again. Our native **Cottonwood** is still one of our best trees where it may have plenty of room, but for an average city lot it is entirely out of scale. Do not plant trees too close together. Thirty to forty feet apart is close enough for street trees, which means not more than one or two to a fifty foot lot. It is especially important that trees be dug with a good proportion of roots, and that they are handled carefully and promptly so that these roots have no chance to dry out.

One of the best shade trees to plant in Colorado is the **Thornless Honeylocust**. This is a very hardy, drought resistant tree. The **Hackberry** is equally hardy but difficult to transplant in larger sizes. The **American Elm** is subject to great damage from the Elm Scale unless frequently sprayed, but is still one of our best trees. The **Silver Maple** is a beautiful tree and of medium rate of growth. The **Green** and **White Ash** are slow-growing and tough. **American Linden** trees are very symmetrical and beautiful, but are a little difficult to establish. Oaks are very fine when established but do not like most of our alkaline soils.

Small trees for specimen use or special situations include the **Russianolive**. This tree has silvery leaves and an informal habit of growth which is very attractive. The **Mountainash** has a neat habit of growth and spectacular orange fruit in the fall. The **Hopa** (red) **Dolga** (white) and **Bechtel** (double pink) **Crabs** are beautiful in flower and stay rather small. Haw-



SOFT MAPLE

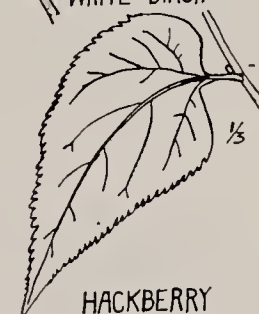


WIER'S
WEEPING

CUTLEAF
MAPLE



AMERICAN
WHITE BIRCH



HACKBERRY



BLACK WALNUT



thorns make beautiful specimen trees with their attractive flowers and fruit.

There are many other trees to choose from for special places if one cares to try the unusual kinds. **Black Walnut, Catalpa, Kentucky Coffeetree, Cutleaf Birch** and **Horse Chestnut** are occasionally used. In non-irrigated areas some of the "weedy" trees are the very best, because without water they grow slower and are hardier. The **Siberian Elm** responds to water so well that it is a soft easily-broken tree in irrigated areas, yet it has proven one of the best under dryland conditions. About half of the trees now growing in the plains area of Eastern Colorado are Siberian Elm.

EVERGREENS

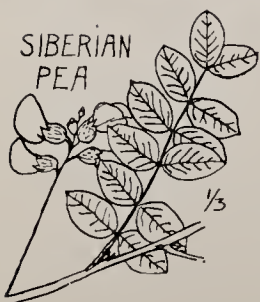
Most plantings need a few evergreens to give them added variety and contrast, as well as to give them winter color, but of recent years the planting of evergreens around foundations has been much overdone. We can not successfully grow many of the nice dwarf evergreens which are so effectively used for foundation plantings in other parts of the country. To substitute trees which will eventually grow too large is one of the most common mistakes made.

Blue Spruces are among our most popular trees, but are seldom suitable for use in a front yard. The larger growing pines have limited use in city plantings. The most useful and popular upright evergreen for Colorado use is the **Colorado Juniper**. It can be sheared and kept in bounds for many years. Consider its future size when planting it and do not use too many. Several of the slower growing pines are adapted for use in small yards. The **Limber** and **Bristlecone Pines**, native of high altitudes, are successfully used where a small evergreen is needed. In still smaller scale is the native **Pinyon Pine**. For low foundation plantings the **Mugho Pine** is very effective.

There are many low junipers on the market, but for our climate the **Pfitzer Juniper** makes the best showing, where a large spreading plant is needed. For use in smaller places the **Tamarixleaf Juniper** is our best plant. It is much slower growing and holds its color well in winter. The **Sabina Juniper** is similar to the Pfitzer and is preferred by some. Most of the very low junipers are not hardy here. Just as well not waste money on arborvitae and yew trees, as only a few have ever survived in this climate.

SHRUBS

Trees may be the backbone of the landscape planting, but shrubs furnish the flesh and muscles. There are a great many kinds available in sizes from almost tree-like to low creepers. They may be had in a great variety of shapes, textures and adaptability



to sun and shade. Flowers of various kinds and colors add to their attractiveness. There may not be "one best" shrub for every situation, as we usually have several kinds which will fill any given set of requirements. The first consideration in selecting the proper shrub is its ultimate height. We will here roughly classify shrubs as Tall, (over 6 feet) Medium, (3 to 6 feet) and Low, (under 3 feet).

Tall Shrubs

Of the tall shrubs, the following are most commonly used. **Amur Maple** for its beautiful fall color. **Hawthorns** for their sturdiness and beautiful flowers and fruit. **Euonymus** for good fall color, bright fruit and ability to tolerate shade. **Forsythia** for their golden bells in early spring. **Mockorange** for their fragrant white flowers. The **Bush Honeysuckles** for their quick growth under difficult conditions. The **Flowering Plum**, **Purpleleaf Plum** and **Manchu Cherry** for their flowers, colored leaves and valuable fruit. **Lilacs** are old standbys, and may now be had in a great variety of colors. The lilac species, such as **Late Lilacs**, and **Persian Lilacs** are valuable additions to any planting. Most of the **Viburnum** family are good here. This includes the **Snowball**, **Arrowood**, **American Cranberrybush**, **Wayfaringtree**, and **Nannyberry Viburnum**. Tall shrubs are used as backgrounds, screens and for high points around foundations. When a tall, slim shrub is needed **Siberian Peashrub**, **Nannyberry Viburnum** and some **Euonymus** will often be suitable.

Medium Shrubs

The medium height shrubs are the most useful. This size includes the **Spireas**, which are all good, though they have been generally overplanted. The **Redosier Dogwood** is especially beautiful in winter in connection with evergreens. One black-fruited and one red-fruited **Cotoneaster** (pronounced co-to'-ne-aster) are hardy here. They are such neat trim shrubs that we do not miss their absence of conspicuous flowers. Several of the **Dwarf Mockoranges**, such as **Lemoines** and **Bouquet Blanc** are very beautiful and easily grown. In early spring everyone wants a **Flowering Quince**, (red) **Flowering Almond** (pink) and **Forsythia** (yellow). The **Dwarf Ninobark** is becoming more popular each year. In addition to good foliage, shape and flowers, it has colored seed heads and good fall color.

Low Shrubs

When we try to select good low shrubs we feel the need of our proposed Rocky Mountain Arboretum. There must be many more good low shrubs for Colorado if we could experiment and find them. Most of the **Barberries** are effective here. In general they require a rich, heavy soil to do their best. The **Japanese Redleaf**, **Mentor** and **Columnberry** are all adapted for use here. The **Alpine Currant** is slow-growing, nicely shaped and hardy. The **Froebel Spirea**, which produces



THICKET HAWTHORN



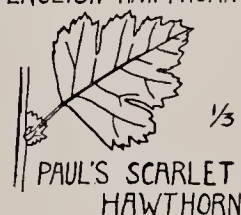
COCKSPUR THORN



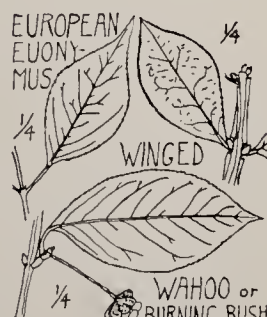
DOWNY HAWTHORN



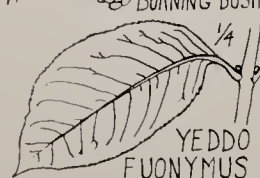
ENGLISH HAWTHORN



PAUL'S SCARLET HAWTHORN



EUROPEAN EUONYMUS



YEDDO EUONYMUS



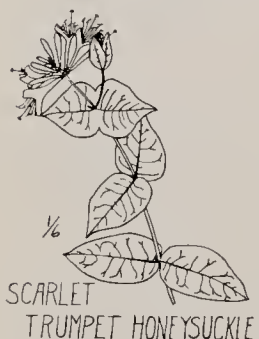
Wahoo or BURNING BUSH



REGEL PRIVET



HALLS JAP. HONEYSUCKLE



SCARLET
TRUMPET HONEYSUCKLE

magenta flowers in summer, is most useful. The **Snowberry** and **Coralberry** are extensively used, especially in shady places. Our native **Bush Cinquefoil** is effective when used as a "facer." For very low effects nothing has been found to equal the **Lodense Privet**.

HEDGES

Informal or unclipped hedges may be made of any shrub which is sufficiently dense and will grow to the desired height. Clipped hedges must be made of material which will sprout out new growth from the clipped ends and become more dense as it is clipped.

For tall hedges, (4 to 8 feet) **Russianolive**, **Siberian Elm**, **Siberian Peashrub**, **Bush Honeysuckle**, **Common Lilac** and **Colorado Juniper** are effectively used.

Privet is still the best material for medium hedges. (2 to 4 feet). The **English or Thompsons Privet** makes dense, dark green hedges which hold their leaves till very late in the fall. **Peking Cotoneaster**, **Vanhoutte Spirea** and **Dwarf Ninebark** make good clipped hedges. **Pfitzer Juniper** and **Mugho Pine** can be trained to make good evergreen hedges.

Low hedges may be made of **Lodense Privet**, **Columberry**, **Japanese Barberry**, **Alpine Currant** and **Dwarf Peashrub**.

VINES

Almost any yard could well use a few vines. For clinging to a south wall the **Engleman Ivy** or its refined cousin, the **StPaul Ivy**, are about the best ones we can use. **Boston Ivy** and **English Ivy** are neater and slower growing but will usually only survive on a shaded north wall. For covering fences the **Sweet Autumn Clematis**, **Silverlace Vine** or one of the many good vining **Honeysuckles** are effective. Grapes may be used to climb over a trellis or pergola.

FRUIT

Most yards have room for a little fruit. **Montmorency Cherry** and **Dolgo Crabapple** bear excellent fruit but still are among the best as ornamentals. **Everbearing Raspberries** and **Strawberries** require little room but may produce very fine fruit. **Gooseberry**, **Currant** and **Sandcherry** bushes are equally valuable for fruit and ornament. **Manchu Cherry** is a new ornamental, which in favorable seasons bears quantities of bright red cherries of high quality.

ROSES

Roses are so variable in habit that some might be included under the head of Shrubs, some under Vines and some under Perennials; yet they are such a large and important group that we will recognize them by giving them a heading of their own. Some of the tall shrub roses are indispensable in any shrub grouping. The **Harrison Yellow**, **Persian Yellow**, **Hugonis** and **Austrian Copper** are all beautiful and spectacular. Climbing roses such as **Pauls Scarlet**, **Pink Dorothy Perkins** and **Ameri-**

can Beauty are very effective for covering fences and lattice. By far the greatest show of bloom for the least effort comes from the class of roses known as "floribunda." They are easily grown, bloom all summer and are available in a variety of sizes and colors. **Improved Lafayette, Kirsten Poulson, Karen Poulson** as well as many of the new patented varieties will be a joy to all the whole season through. The red Gruss and Teplitz should really be classed here as it is a very vigorous everblooming rose. The hundreds of varieties of the **Hybrid Perpetual** and **Tea** roses give an unlimited selection to suit everyone's taste. These roses are usually more effective and easily cared for if they are grown in a bed by themselves.

PERENNIALS

To many people, a "garden" means perennials. As the name indicates, they do come up year after year, but no perennial border "stays put" indefinitely. They must be renewed, replanted and thinned every few years. There are many fine plants which may be grown by those who are willing to coddle them, but the basis of most perennial gardens should be of "foolproof" plants. Next to hardiness, color, season, form and height are factors to consider in choosing perennials.

Tall Perennials

Delphiniums head the list of good tall perennials. They now are available in a variety of beautiful shades and in immense sizes. The **Yellow Heleniums** and **Helianthus** are suitable for backgrounds in almost any garden. The tall **Fall Asters** in the new pure colors are now very beautiful and still hardy. Tall **Blue Salvia, Goldenrod, and Hollyhocks** are effectively used.

Medium Perennials

The bulk of the useful perennials come in the medium height class. **Peonies** and **Perennial Phlox** are indispensable in any garden. **Shasta Daisies, Coreopsis, Columbine** and **Early Chrysanthums** are easily handled. **Painted Daisies, Oriental Poppies, Daylilies, Gaillardias, Bleeding Hearts** and **Monarda** are reliable and beautiful.

Low Perennials

There are not so many low perennials to choose from unless we go into the rock garden class of creepers and mat plants. Low **Early 'mums, small Dianthus, Blue Flax** and **Trailing Phlox** are all hardy and useful for foreground borders. Several varieties of **Veronicas, Campanulas** and **violas** are excellent for low borders or massing.

BULBS

Bulbs might roughly include all the plants with thickened roots. The fall (spring flowering) bulbs are probably the most useful, and of these the Tulip is best known. Most all types of tulips do well here if properly planted. In general all these bulbs do better in this climate if planted a little deeper than most directions indicate. Various kinds of **Narcissus, Hyacinths, Scillas, Crocus** and such will usually grow here, but many of these are unreliable and only persist a year or two. Dahlias and Gladiolus are chiefly flowers for the hobbyist. They come in a great variety and are usually handled, like roses, in a bed by themselves. Lilies vary greatly in their hardiness and cultural requirements, but some of them like the **Umbel** and **Tiger Lilies** may be successfully grown in any garden.

ANNUALS



POETICUS NARCISSUS.

No planting is complete without including some annuals. There comes a time in July and August when the best planned perennial borders would look barren without a few appropriate annuals. There is a great variety to choose from for those who want to play with them, but for most people it is better to stick to the hardiest kinds. **Zinnias** and **Petunias** are always effective in Colorado. They are especially adapted to mass plantings. **Mari-golds**, **Calendulas**, **Annual Larkspur** and **Snapdragons** are also very easily grown, usually self-seeding. For taller effects use **Cosmos** and **Annual Dahlias**. **Sweet Alyssum**, **Portulacas**, and **Pansies** make easily grown low borders. **Verbenas**, **Phlox**, **Nasturtiums** and **Poppies** will add color and variety to the garden.

Sweet Peas and **Morning Glories** are annual vines which may be grown by anyone.

Annuals may be planted among the perennials, in the borders or be used in groups by themselves. The "flower bed" cut in geometric pattern out of the center of the yard is usually poor design and a bother to take care of. Annuals are very effective when planted to follow bulbs such as tulips.

WHERE TO GET PLANTS

Usually the local nurseries can give better service than distant firms. Many of the attractive plants offered in eastern catalogs are not suitable for planting here. The local firms should have a better idea of what will be hardy in this state. Use good business judgment in selecting the firm to deal with. Your neighbors who have had many years dealing with nurseries are good ones to go to for advice. Do not expect to get good plants or services for bargain prices.



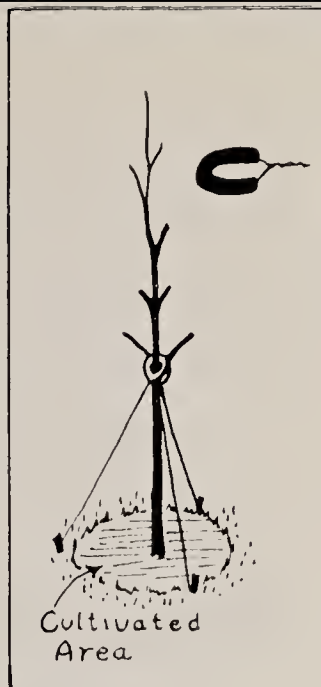
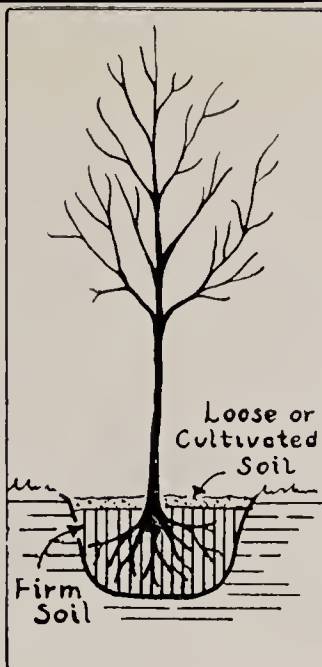
LARKSPUR

HOW TO CARE FOR PLANTS.

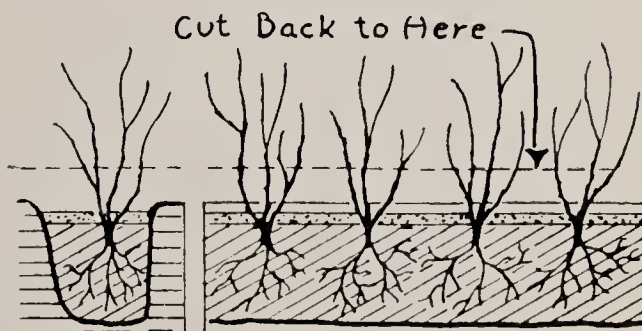
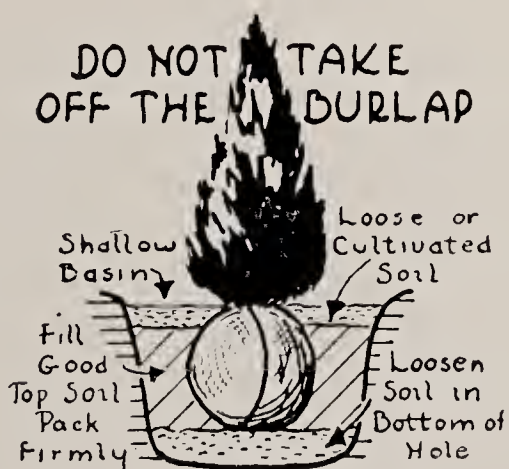
The reliable nurseries will deliver your plants in good healthy condition. How they grow and thrive will depend on how you treat them later. Never let bare-root plants lie in the sun and wind for even a few minutes. Throw a wet sack over them if you will plant them soon, or cover the roots temporarily with soil if they must lie for several hours. Dig all the holes to receive plants plenty large. It will help the plant to get its new roots established if there is considerable good loose soil around them. Spread the roots out naturally in the hole and set at about the same depth as it grew in the nursery. Fill in carefully with loose soil and water by working the hose down through the soil to the bottom of the hole and let the soil settle from the bottom up. This is less liable to leave air pockets than to tramp the soil in.

Most all trees and shrubs should be cut back or thinned about one fourth to one third, after they are transplanted. They will be healthier and larger by fall for this treatment.

Watering is one operation where a "green thumb" is valuable. Different plants need different amounts of water. In general water so that the soil a foot or so below the surface is wet. The condition of the surface matters little. Care should be taken, especially in heavy soils, to avoid overwatering so that the soil is soggy. This condition is as bad as too little water. Sprinkling newly moved plants over the top is often beneficial, but this treatment seldom does more to the soil than bake the surface. Water thoroughly when you do water, and avoid frequent light sprinklings.

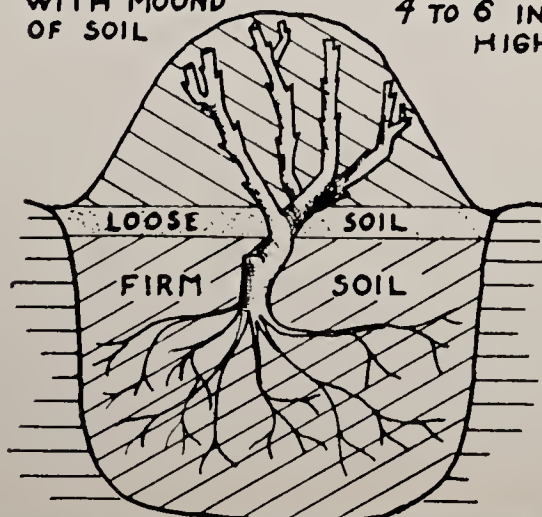


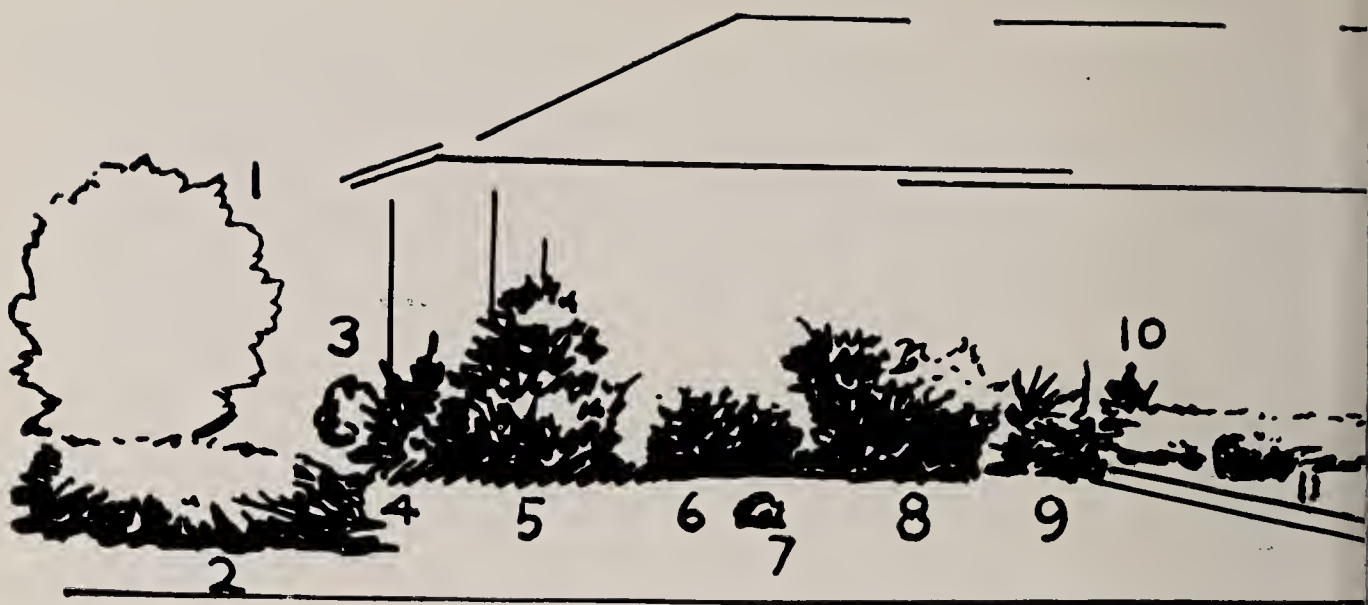
DO NOT TAKE
OFF THE DURLAP



COVER COMPLETELY
WITH MOUND
OF SOIL

PRUNE TO
4 TO 6 IN.
HIGH





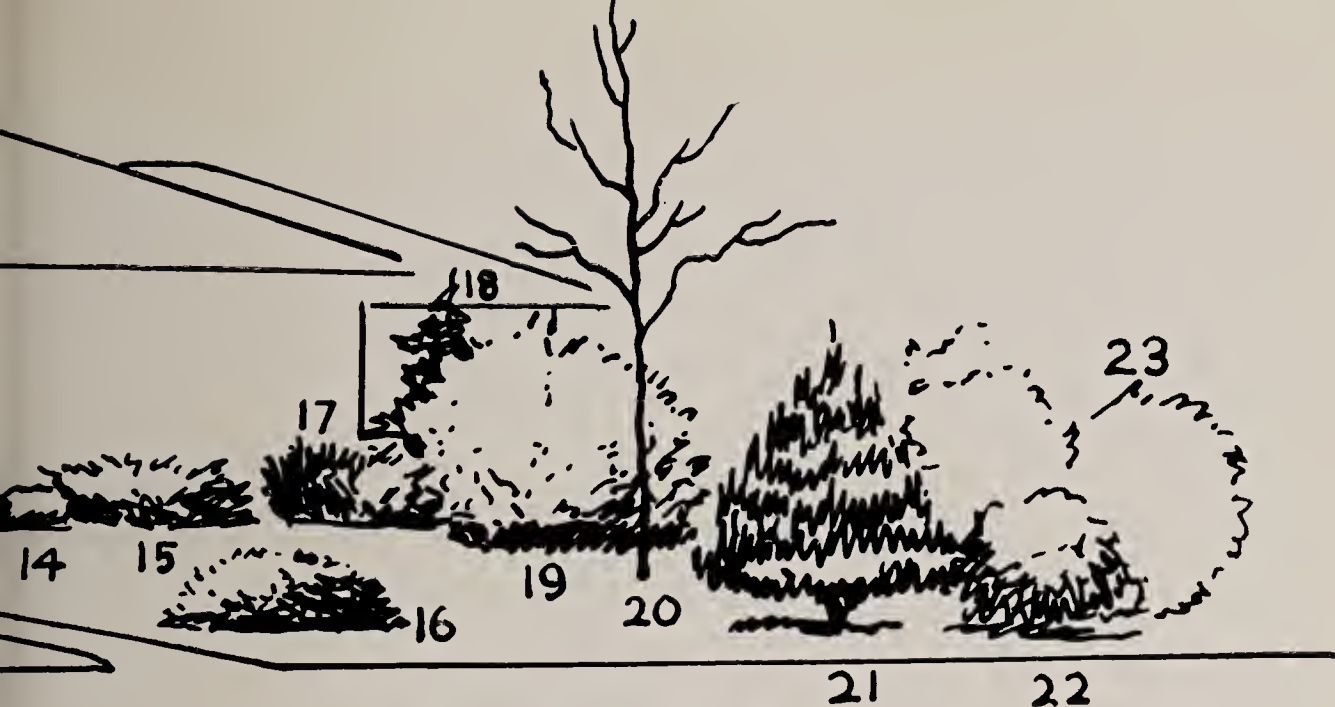
Evergreens are always delivered "balled and burlapped" as they can not stand having their roots exposed to the air for even a few minutes. Take care not to break this ball of earth when handling it. Always handle by the ball and not the top. Dig holes to receive evergreens just the depth desired but considerably larger than the balls. Place the ball in the hole and adjust to suit, then fill the hole halfway up with loose soil and loosen the burlap around the top of the ball. Finish filling in and water as for shrubs. Do not attempt to remove the burlap before placing in the hole.

It is important to get orders for nursery stock in early. For most things early spring is the best time to move them, but some fast growing trees and shrubs and certain perennials are properly moved in the fall. Planting time is that period between the time that leaves fall and the time that they reappear. During the middle of this period frozen soil will usually prohibit the moving of plants for several weeks. The spring planting season is usually from the middle of February to the middle of May, and the fall season is usually from October 15 to December 15.

Do not forget that our warm sun and dry air will draw moisture out of plants all winter even though the leaves are off, so be sure that all plants go into winter with the soil around their roots wet, and that they are given additional water during those frequent warm dry periods of our typical Colorado winter. The tender or "borderline" trees and shrubs should have some shade provided, at least the first winter.

GARDEN ACCESSORIES

Landscaping does not stop with the planting of trees and shrubs. Proper designing and construction of walks, walls, platforms, drives, gates, fences, fireplaces, pools and garden furniture are all important parts of a complete and satisfactory garden plan. Our native flagstone fits in with other garden features better than concrete in most cases. Some beautiful effects can be achieved by its proper use.



COST

By this time all readers are asking, "But what will this cost me?" So that you may have an idea of approximate cost we have reprinted the numbered drawing used in the September Green Thumb as an example of what an average front yard may be planted for. We have changed the plants used in the original plan to more common, inexpensive and foolproof kinds. We then asked several prominent nurserymen to give an estimate of what this planting should cost at

this time. The prices here quoted are an average of these various quoted prices. Of course there was a variation of as much as 25 % each in some individual quotations as compared with this average. This is because of variations in size and quality of plants furnished by different firms and varying degrees of service and guarantee offered. By multiplying or dividing this estimated cost the approximate cost of smaller or larger plantings may be determined.

KEY TO PLANTS SHOWN IN DRAWING

1. French Hybrid Lilac.....	3-4 foot
2. Forsythia suspensa.....	2-3 foot
3. Japanese Barberry.....	1½-2 foot
4. Hugonis Rose.....	2-3 foot
5. Pinyon Pine, B. & B.....	3-4 foot
6. Peony.....	No. 1 Div.
7. Floribunda Rose.....	No. 1
8. Bridal Wreath Spirea.....	3-4 foot
9. Redleaf Jap. Barberry.....	1½-2 foot
10. Flowering Almond.....	2-3 foot
11. and 12. Froebel Spiræa.....	12-18 in.
13. Dwarf Ninebark.....	2-3 foot
14. Floribunda Rose.....	No. 1
15. Goldflame Honeysuckle.....	No. 1
16. Tamarixleaf Juniper, B. & B.....	1½-2 foot
17. Pfitzer Juniper, B. & B.....	2-3 foot
18. Colorado Juniper, B. & B.....	4-5 foot
19. Redtwig Dogwood.....	2-3 foot
20. Thornless Honeylocust.....	2-3 foot
21. Mugho Pine, B. & B.....	1½-2 foot
22. Garland Spirea.....	2-3 foot
23. Winged Euonymus.....	2-3 foot

Average price quoted for material only.....\$77.00

Average price planted and guaranteed.....\$100.00

SOIL

The proper preparation of soil around a house where plantings are to be made is one of the most important things to be done. Trees, shrubs, flowers or grass planted in poor soil can never grow vigorously and give much satisfaction. If possible, check the soil before, during and after building. Do not let the contractor remove or cover up any of the good top soil, or dump any plas-

ter or rubbish in the yard to be covered up or mixed with the good soil. Hauling out poor soil and hauling in good is expensive, but money well spent. Add manure, peat or leafmould if possible and work the ground up deeply. Soil that a vegetable grower would expect to raise good crops from will also produce vigorous trees, shrubs and grass.

SHRUBS THAT WILL ENDURE PARTIAL SHADE

Barberries	Cotoneaster	Forsythia	Spireas
Buckthorn	Currants	Honeysuckles	Sumacs
Buffaloberry	Dogwood	Lilacs	Viburnums
Cinquefoil	Elderberry	Mockoranges	Willows
Coralberry	Euonymus	Privets	

SHRUBS THRIVING IN HOT DRY PLACES

Alpine Currant	Cotoneaster	Native Clematis	Shrub Roses
Barberries	Indigobush	Rock Spirea	Siberian-Peashrub
Buckthorn	Leadplant	Rose Acacia	Spireas
Buffaloberry	Lilacs	Russianolive	Squaw Currant
Cinquefoil	Matrimony Vine	Sandcherry	Sumacs
Cherrystone Juniper	Mountain Mahogany	Seabuckthorn	Tamarix
Colorado Juniper	Mugho Pine		

TREES AND SHRUBS TOLERATING ALKALINE SOIL

Buckthorn	Lilacs	Rose acacia	Siberian Elm
Cherrystone Juniper	Honeylocust	Russianolive	Sumacs
Honeysuckles	Matrimony Vine	Siberian Peashrub	Tamarix
Leadplant	Poplars		

SPRING-FLOWERING PERENNIALS

Bleeding Heart	Iceland Poppies	Mertensia
Dianthus	Lupines	Trailing Phlox

SUMMER-FLOWERING PERENNIALS

Balloonflower
Coreopsis
Columbine
Gaillardia
Baptisia
Delphinium
Digitalis
Flax
Campanula
Monarda
Mertensia
Oriental Poppy
Pentstemon
Shasta Daisy
Stokesia
Veronica
Gayfeather
Hollyhock
Phlox
Scabiosa

FALL-FLOWERING PERENNIALS

Chrysanthemums
Fall Asters
Goldenrod
Helenium
Hibiscus
Plantainlily
Salvia



BIG TREES

L. C. SHOEMAKER

MUCH has been written in recent years about big trees, for the subject is as perennial as trees themselves and seems to be as inexhaustible. Man's inherent love of trees goes back to the beginning of time, and he has always been interested in and intrigued by the tree of exceptional size. Therefore, "doin' what comes naturallee," whenever he finds a big tree, he tells his fellow man, for he knows the other fellow will be as interested as he.

The size of trees is comparative. A member of a species is large when compared with other members of the same species in a given locality. Colorado's largest tree is a mere weed when compared with California's "General Sherman," and all its trees are "toothpicks" when compared with the giant redwoods and firs of the Pacific Coast states. But, according to the above rule, we do have big trees in the Rocky Mountain region.

The most important Colorado tree (not the largest) is a Colorado Blue Spruce (*Picea pungens*), for it is the largest known member of that species. According to E. J. Fontenberry, assistant supervisor of the Gunnison National Forest, it stands on the West Elk Creek watershed in that Forest, more definitely described as Section 11, T. 49 N., R. 4 W., NMPH. It is 11 feet 9 inches in circumference and 123 feet in height.

In 1942, the American Forestry Association included this spruce in its hall of fame for trees. It showed the largest trees of their species reported to them prior to March 1 of that year, a long list extending across 35 states and Alaska. Colorado's only member

was this Blue spruce—a **Colorado** Blue spruce, however, proudly upholding its name.

Our largest Engelmann spruce (*Picea engelmannii*) also stands on the Gunnison National Forest. Its location has been placed in Section 27, T. 51 N., R. 5 W., 6th PM—the Curricanti Creek watershed. Its size is not definitely recorded, being placed at over 15 feet in circumference and 164 feet in height by Theodore Krueger of the Forest Service and Ben Heilman, a retired forest ranger, who located it in 1929. The Flatland National Forest of Montana grows the largest member of the species, according to the American Forestry Associa-

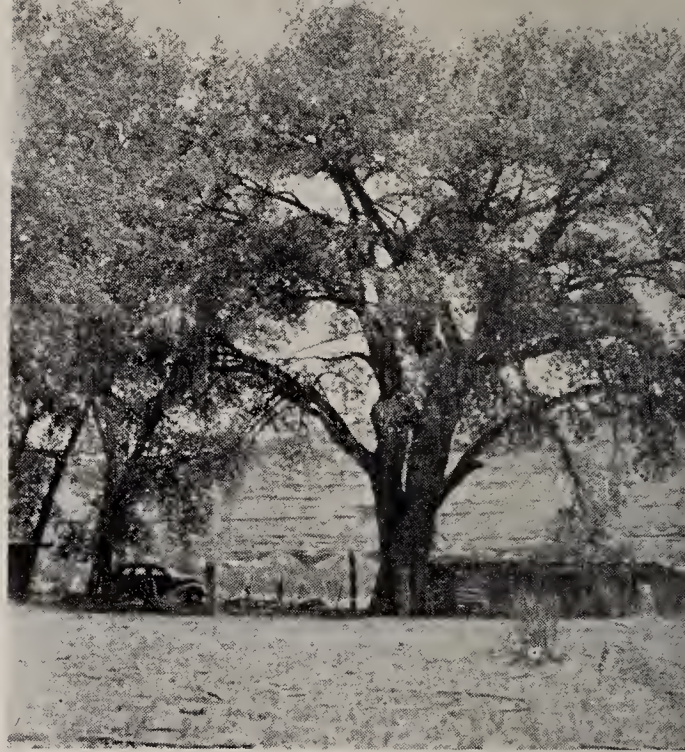


LARGEST ENGLEMAN SPRUCE OF
RECORD IN COLORADO

tion. It is 19 feet 4 inches in circumference and 80 feet in height.

Our largest Douglas fir (*Pseudotsuga taxifolia*) of record is growing on the Cross Creek watershed of the Rio Grande National Forest west of South Fork. It is 16 feet 10 inches in circumference and 85 feet in height. Another fir of equal size grows in Wild Basin of Rocky Mountain National Park, but it is a double tree, each part being considerably smaller above the fork. The AFA list shows the largest specimen to be growing in Olympic National Park in Washington. It is 53 feet 4 inches in circumference and 221 feet in height.

THE BIG LIMBER PINE OF SAN ISABEL NATIONAL FOREST
—Photo by U. S. Forest Service



COTTONWOOD TREE IN GUNNISON RIVER CANYON

Our largest Limber pine (*Pinus flexilis*) grows on the San Isabel National forest. Paul Gilbert, a former forest ranger on the Huerfano district, once gave me the exact location, but it has been misplaced. The pine measures 18 feet 10 inches in circumference and 67 feet in height. A larger specimen grows on the Medicine Bow National Forest of Wyoming, about 22 miles southwest of Saratoga. It is 19 feet 11 inches in circumference and 48 feet in height. The AFA list shows the largest of the species in the Toiyabe National Forest of Nevada, with a girth of 21 feet and 1 inch.

Our largest Cottonwood (*Populus Wislizeni*) is growing in the Gunnison River canon, about 22 miles northwest of Delta. It is 19 feet 8 inches in circumference and 80 feet in height. The AFA list shows the largest Cottonwood to be on the Cover ranch near Thermopolis, Wyoming. It is of the more common variety—*Populus sargentii*—and has a girth of 29 feet 8 inches and a height of 55 feet.

There seems to be no definite record of large pines, pinons, junipers, aspens, oaks, and a few other species in the State. The Association will gladly welcome reports on big trees of these or

other species and will from time to time give credit to donors in The Green Thumb. Perhaps in this way we may compile a hall of fame for Colorado trees. Who will be the first?

FORESTRY ON THE MARCH

By ALLEN S. PECK

Things are stirring nationally in the fields of forestry and of wild land use and management. There is much going on which holds interest for all who believe in right use and conservation of our natural resources and which have implications and possibilities of special concern to Coloradoans.

Many of our members have doubtless read in recent issues of "American Forests" about the third "Forest Congress" planned and conducted by the American Forestry Association. This was held in October and is covered rather fully in the November number of the magazine. Preliminary to the holding of the Congress a committee of experts and well informed leaders in forestry and related fields met at Higgins Lake, Michigan, and prepared a program for the future of forestry in this country, which program served as a basis for discussion at the Congress. The chairman of the program committee was Colorado's own Judge Clifford H. Stone, Director of the State Water Conservation Board and a man well versed in water problems and acquainted with the importance of watershed protection. This program was in turn based upon study of a report on an appraisal survey of forest conditions in the various states made during the last couple of years, in which one of the directors of the Colorado Forestry and Horticulture Association, J. Lee Deen, Dean of Forestry at Colorado A. & M. College participated. The complete proceedings of the third

American Forest Congress will be issued shortly in book form and a copy will be on file in our Association library. You will find in this volume much about the proposals for public regulation of privately owned forest lands—both for and against it, and by what authority, Federal or State. If you think that the people generally of these United States have no need to be further concerned about the future of their forests, you will change your mind, I am sure, after reading what was said at the Congress and studying the facts presented by the speakers and the Forest Appraisal Report. For instance it was said that of the 75% of our commercial forest acreage which is privately owned, 75% in turn is made up of small holdings on which only 4% of the cutting follows good practices. This national picture is one which we in Colorado with our relatively large area of National Forests are apt to overlook.

However, we have a real need for a forestry set-up right here that would make it possible for the State Forester and a staff of assistants to give private land owners advice and help. This would go a long way toward correcting bad cutting practices. To help things along our Association is sponsoring a study of what this state needs in the way of forestry work and of an organization and facilities with which to do it. This study it is hoped will be made shortly by the Forest Survey Committee of the Charles Lath-

rop Pack Foundation and the Society of American Foresters.

Turning now to National Forests, there is a movement on foot that may threaten them (and even some National Parks) ultimately with disintegration. This is the proposal to turn Federal public lands over to the states with the express end and aim of getting "grazing land" into private ownership through sale to stockmen. Organized stockmen are of course working for this. If they win it would seem logical to expect that the breaking up of public domain pastures would be accompanied or followed by a classification program that would try to cut from the National Forests all lands not actually bearing commercial forest cover but useful for grazing cattle and sheep, and place them on the market. What then of our great western multiple use "commons"—our watersheds, our game ranges, our mountain trout streams, our scenic and recreation areas, breathing

spaces in the years ahead for a nation of two hundred, three hundred, four hundred million people? It would seem that regulated conservative use of mountain ranges by sheep and cattle properly coordinated with other uses is to be preferred, rather than the passing to the stockmen of title to the ranges for their exclusive use.

Perhaps there is something significant in what happened this year on the public domain ranges. The Grazing Service which has been attempting to bring conservative use to these ranges was practically wrecked when its funds were cut in two by the 79th Congress. It has been suggested that a similar fate may be in store for the Forest Service.

This short review is offered by way of reminding ourselves that our Association has opportunities for much constructive effort in forestry as well as in other conservative activities.

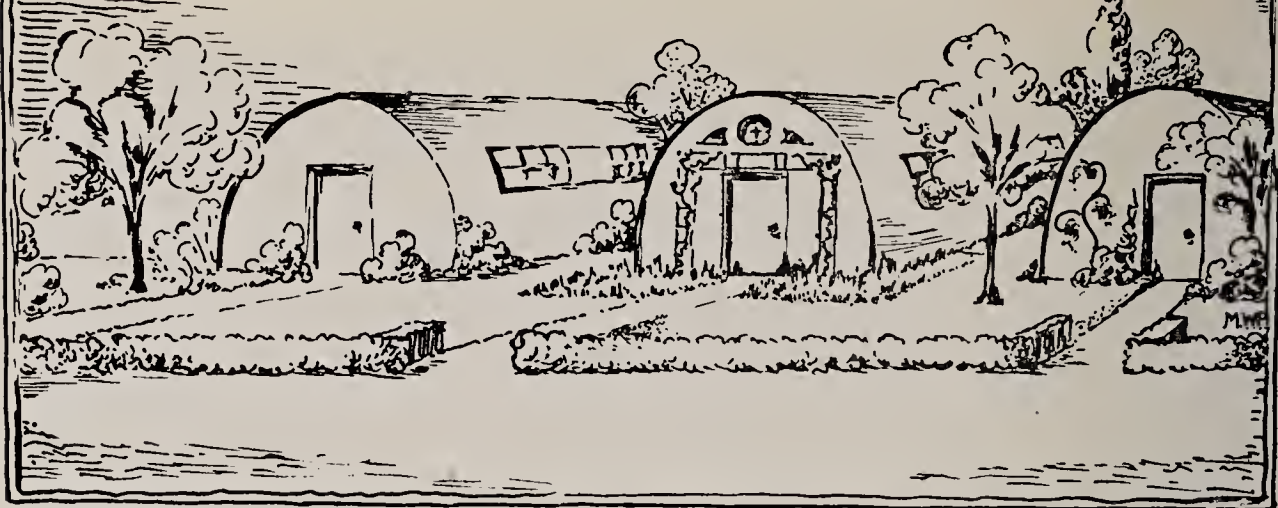
SHEEP ON RANGE NEAR TIMBERLINE—Photo by U. S. Forest Service.





**CATTLE ON HIGH RANGE NEAR HERMOSA-ANIMAS DIVIDE.
NEEDLES MOUNTAINS IN BACKGROUND**

—Photo by U. S. Forest Service.



LANDSCAPE THOSE QUONSETS

M. WALTER PESMAN

NOW, please don't start by saying: "It is not worth while." Sure enough, these Quonsets are supposed to be of short occupancy, and in some cases there is a definite contract that they must go within a certain number of years. But many of us are not too optimistic about the time it will take to catch up with our long-neglected building program, and many of these Quonsets may be occupied for several years to come.

Nor will they improve with age; if they do not please your aesthetic sense now, what will they look like in 1954? So: landscape those quonsets, and make them easier to look at.

Here is another, and a more pleasant thought. Many a young couple might as well have some landscape experience in a Quonset. When they move into their permanent home they will be all the better qualified. Wasteful? Not very, because in the first place the plant material should be the hardy, inexpensive type, and secondly, some of it can be moved to the new location.

The interesting thing is that landscaping Quonsets is not so different from any other landscaping. It all comes down to principles of design.

Yes, and principles of landscape design,—or of design in general,—are the same, whether

you apply them to an Italian villa, to a mountain cottage, to an insane asylum, or to our latest problem child, the Quonset hut. Only the application of these principles differs in each case.

Whatever is said in this article on landscaping a Quonset can be used for other home landscaping,—with a few modifications. If we will only put important things first and minor decorations last, we won't go very far wrong.

Unity. Let us begin with the general picture, the setting of the home. Even in a city block we should pay attention to the street as a whole before deciding on the type of tree for the parking, or the character of a hedge. In a Quonset layout this becomes all the more important since there is no getting away from the general pattern. It is just as important in this case to unify the layout,—say by a type of low hedge, or a row of small trees,—as it is to give individuality to each home. Unity and variety,—the age-old twins in any design. This unification can be achieved either by the organization responsible for the entire layout, or by co-operative action of the "owners" of these "homes." In the treatment it is highly desirable to increase privacy; a hedge does it effectively.

Scale. How high is a Quonset? Nine feet? Then we should be

careful not to get trees that will be overpowering in their height; In Colorado we have a number of small trees that will stay within bounds, such as hawthorns, crabapples, pinyon pines, mountain ash, Russianolives, Japanese varnishtrees, native alders and birches; then there are a number of shrubs that can be trimmed as small trees, such as lilacs, caragana, some viburnums and some Prunus species. An occasional taller tree placed just right to furnish shade on the southwest side, (where the hot afternoon sun strikes the house), may not overwhelm the layout too much, but care is the watchword.

This matter of scale also influences the choice of shrubs. It is most desirable to break the monotonous ground line with a clump of shrubs here and there; it is unforgivable to swathe the entire foundation in a continuous line of tall shrubs. Anything more than four or five feet in height is apt to give a smothering effect. Two or three feet is better. Symphoricarpos, hybrid snow garland, (and other low spireas), flowering almond, shrubby cinquefoil, low caragana and low amorpha, Lodense privet,—these are illustrations of such low shrubs. Most annuals are in scale, but even dahlias and golden rod are apt to look unpleasantly tall. And certainly Goldenglow is in that category.

Individuality. The more monotonous a row of houses, the greater the need for individuality to be shown by the inhabitant. Our front door is said to be the gauge of our personality. Oh, for ideas about Quonset front doors. Two possibilities present themselves: front door planting and “applique effect on the wall. Some front yards may feature flowers and flower beds (but, please, not the timeworn round kind!), others may add a colorful flowerpot array, a seat, even an individual-

istic foot scraper. Others may restrict themselves to a dignified and very simple shrub planting; even a “stoop” treatment is not impossible.

Lattice work for climbing vines or merely for decoration, does much to rest the eye from looking at the recurring half circle.

Since the war we find a few decorative pot holder scrolls in the stores again,—a clever device for adding both line and color to a blank wall. And they need not be expensive.

At the risk of being banished from the landscape profession I might remind you that surface decoration in paint is an old, old device that dates way back into antiquity. In some cases: “what was good enough for our forefathers, might be good enough for the Quonset-hutter.” Of course, aesthetic danger lies that way.

Hardiness. Tea roses and deutzias may be the heart’s desire of the ambitious gardener,—they do not belong in the Quonset community. For two reasons: they will most likely not materialize, and they do not fit, even if they do. With the glare of the metal surfaces, the condition of the soil, the change of occupancy,—nothing but the hardiest plant material can cope. And a well-grown, happy-looking petunia is much more fun to water and cultivate than an aristocratic but anemic rose or English primrose. Most annuals are easy, many shrubs will stand neglect, even Michaelmas daisy and common woodbine are not to be sneezed at if kept in check.

Unity, scale, individuality, and hardiness then, are all-important in the landscape design of a “difficult” home. With their careful consideration even a Quonset hut can be made into a livable home, instead of just a product of our not-too-happy post-war period.



Oh, who can resist the hills in the spring, when Pasque Flowers are blooming, and everything is full of new life, and the birds on the wing? We all want to sing.

Or, who can stay home, those days in the fall when Aspen are covered with gold, and all the high peaks and valleys, with Pine trees tall do beckon and call?

Yes, most of us live here in Colorado to be near the mountains that we all love so; to see their wild beauty, and green things that grow, all summer we go.

But, have you learned that there's nothing to fear from roaming the mountains each month of the year? That snow-covered trails should not interfere, though cold be severe?

Sure, skiing is fun, you ride up, slide down; its grand in the winter to get out of town and let the sun shine on faces 'till brown, and eat like a houn'.

But have you in winter hiked over the trail that you knew in spring, up the hill and down dale; when wild-flowers were bright and sunlight was pale? Then do not fail.

If you will wear snowshoes they'll make you go slow and see all the tall trees and birds that you know. Or you can find hillsides not covered with snow, where you may go

If your shoes are right and all clothes are warm you need not have fear in the fiercest of storm. You'll find sheltered spots that you may transform, and camp work perform.

So, try sleeping out, on some fine winter night, beneath a big rock, in your sleeping bag tight. It'll thrill you to try, and to lick Nature's might. You'll feel just alright.

GEORGE W. KELLY.





CANAERT REDCEDAR, *Juniperus virginiana canaerti*

Color cuts courtesy of the D. Hill Nursery Co., Dundee, Ill.

OUR LIBRARY

Perhaps the most important and useful feature of our new "Forestry House" will be the library. Mrs. Helen Fowler has been giving a great amount of her time in the past months to interesting friends in this project. At this time, almost \$3000.00 has been given with which to purchase books. Many valuable books have been donated, and Mrs. Fowler is compiling a list of the most useful books to purchase when the shelves are ready. Quoting from her report to the Association recently. "Perhaps no where in America has an horticultural library had a beginning with such gracious giving and good will. In each mail letters and postcards come in indicating the anxiety of gardeners to actually see the books on the shelves." * * * The Colorado Forestry and Horticulture Associa-

tion Library shall have for its aim the selection of every book for the use of not only botanists and horticulturists, but for lovers of garden, field and wood; the most valuable authoritative information on, every garden subject with the distribution of subjects in groups, and a good beginning list of both technical and non-technical editions to meet the need of the greatest number of users."

Many friends have been assisting Mrs. Fowler in securing valuable books. Dr. Malcolm W. Wyer of the Denver Public Library has given much valuable assistance in securing rare and desirable volumes. Specialists and experts in all phases of Forestry and Horticulture have assisted in recommending the most important books in their special fields.



The Association also plans to give all assistance possible to members and others in finding the information desired and appraising this information as to its application to Colorado's climate.

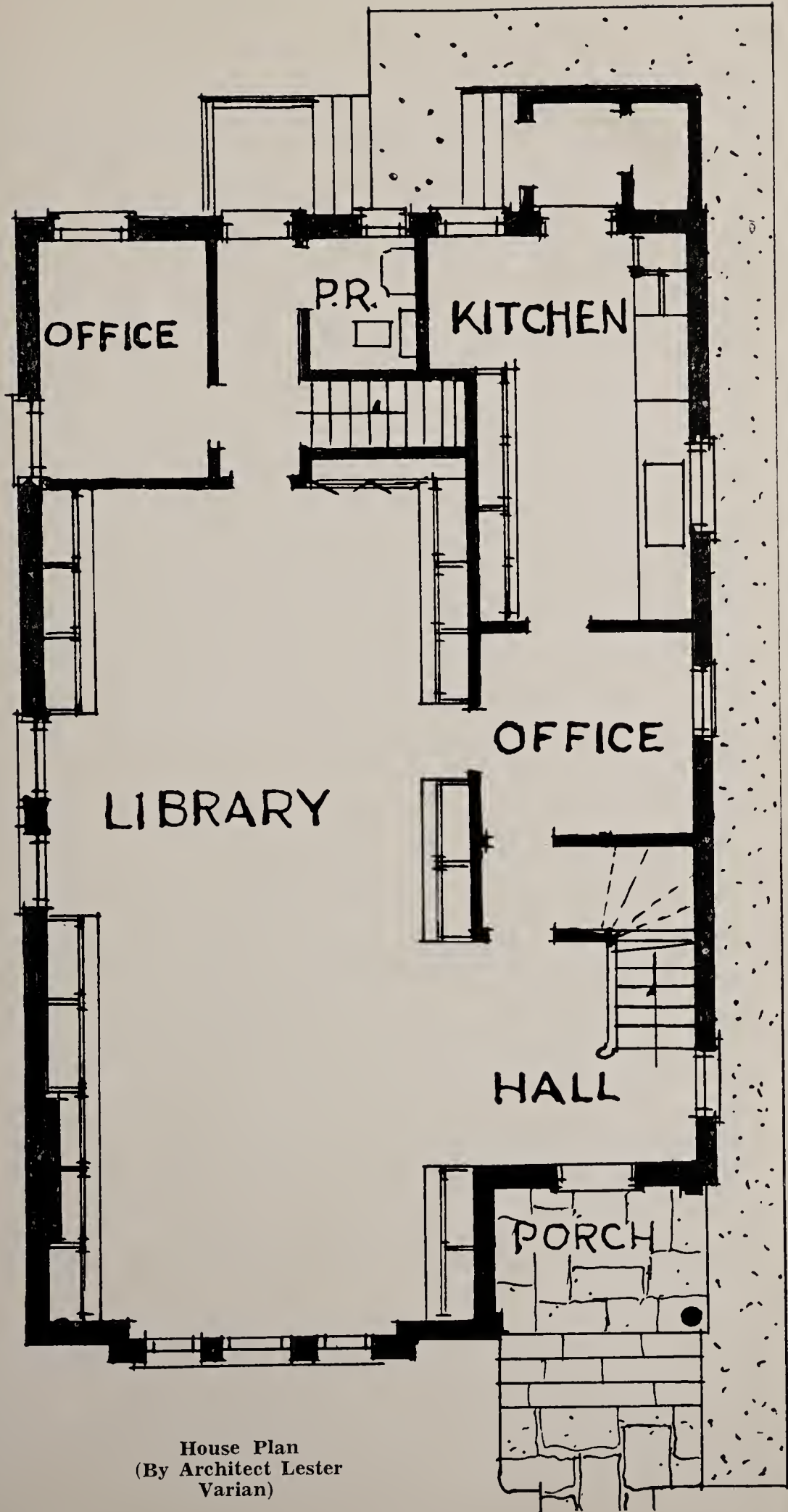
There will be encyclopedias, dictionaries and technical books on every subject that botanists, foresters, gardeners, florists and students might be interested in. Plants for food will also be covered, with books on fruit and vegetable gardening.

Library in
Horticultural Hall
Worcester, Mass.



(Cut loaned by
Editor of
"Horticulture")

House Plan
(By Architect Lester
Varian)





AUSTRIAN PINE, *Pinus nigra*

The Green Thumb

March and April, 1947



~~~~~ THE GREEN THUMB ~~~~~

A Bulletin of the

COLORADO FORESTRY AND HORTICULTURE ASSN.

Organized in 1884

George W. Kelly, Editor

Miss Alice Wood, Assistant to the Editor

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Room 17, 1608 Broadway — Phone Tabor 3410

Denver, Colorado

Hours: 11 to 2 — Monday, Wednesday and Friday

"To preserve the natural beauty of Colorado; to protect the forests; to encourage proper maintenance and additional planting of trees, shrubs and gardens; to make available correct information regarding forestry, horticultural practices and plants best suited to the climate; and to coordinate the knowledge and experience of foresters, horticulturists and gardeners for their mutual benefit."

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VOLUME IV

NUMBER 2

IT IS UP TO US

Several young men have been in the office recently to talk with us about the advisability of getting into some line of horticultural work. In every case the problem has been the same. They love working with living plants but can make more money with less training in other work, such as the building trades. In many cases these young men have studied horticultural subjects for years and would like to make this their life work; but as is usually the case, the woman has the last word, and the wives and prospective wives of these men hesitate to consent to a life work which deprives them of many of the ordinary comforts which those of less education and training enjoy.

This situation IS our responsibility, as we can never expect horticulture to find its rightful place unless we can make it attractive for brilliant young men to stay in this work. When the average home owner knows or cares so little about horticultural things that they are willing to let some ignorant but persuasive talking ash-hauler do their horticultural work, there is little encouragement for ambitious young

men to spend years in study and practice to be expert gardeners.

It is true that a person with horticulture in his blood and a real Green Thumb will prefer this work regardless of the monetary return, but why should we compel these people to live like a country preacher because of their choice of this kind of work. In the past few years property owners have paid absurdly high prices for such necessary work as tree trimming and removing, and have paid little attention to the qualifications or experience of those doing this work. Is it not the responsibility of every true plant lover to learn to distinguish between high-pressure ash-haulers and trained horticulturists, and make it worth while for intelligent young men to study this work. If horticulture is given its proper place as a profession our colleges will be compelled to offer suitable courses in this subject.

The final benefit, after all, will go right back to the home owners, as the really trained and experienced horticulturist will save their clients many thousands of dollars in preventing avoidable damage and in the increased vigor and beauty of their plants.

—George W. Kelly.

ON THE GRAZING FRONT

By Allen S. Peck

“**A**T the 50th annual convention of the American Livestock Association, western stockmen touched off a conservation storm that before the 80th Congress is over may rock the American people.” So says an editorial in *AMERICAN FORESTS*. “And if the Congress fails to raise its guard against hasty action, the storm may rock political fortunes as did the Teapot Dome and Pinchot-Ballinger exposure. The issue involved in this instance is not just oil or coal but virtually all the public lands lying west of the Great Plains, embracing some 400 million acres. The stockmen’s proposals are bold and insidious. After prolonged condemnation of the administration of forage resources of the national forests, they called for a Congressional investigation of the national forests and for passage of legislation to eliminate grazing lands from the forests and make them available for private acquirement. . . . As a raid upon public resources, this plan is astounding in its audacity. Nevertheless, it is within the historical pattern of periodical efforts of western stockmen to break down the national forest and to acquire control of the forest ranges.”

Backing up this editorial expression in the Association’s magazine, the Board of Directors of the American Forestry Association has adopted resolutions voicing strong opposition to all proposals to break down the government’s administration of the national forests and the reserved grazing lands of the public domain. The Board’s resolutions reaffirm the long standing position of the American Forestry Association in support of the

principle of retaining in the federal government board authority to manage the resources of these forest and range lands in the best public interests from the standpoint of forest and forage growth, protection of watersheds, and other services. “The national forests and grazing districts”, they say, “represent the greatest public conservation achievements of the American people. The lands and resources at issue are the property, not of the stockmen or any other special interest, but of all the people.”

Not only the American National Livestock Association but the National Wool Growers Association and other organizations of cattle and sheep men have recently assailed the government’s policies of handling publicly owned lands and in some cases have even gone so far as to request the opening of national parks and monuments to grazing and widespread movement has taken form since a meeting of of the United States Chamber of Commerce held in Denver a year ago last fall. Subsequently a committee representing the two big national associations of cattle and sheep men went into action under a mandate “to propose legislation for the final disposition of the public domain into private ownership.” Two bills with dangerous implications have already been introduced in the present Congress—Senate Bills 33 and 34.

Here in Colorado the movement has manifested itself in strongly expressed opposition by cattle and sheep permittees to reductions which the Forest Service believes needed here and there in the interest of good management and watershed protection.



SHOWING EXCELLENT MAINTENANCE

Home of Mr. and Mrs. Leonard Anderson, 704 W. Orman, Pueblo, Colorado

MAINTENANCE OF THE SMALL YARD

The third and concluding article
of series.

IN the November, 1946 issue of **THE GREEN THUMB**, Mr. Pesman set forth the fundamentals of small home landscaping. Mr. Kelly furnished lists of hardy material in the January, 1947 issue. This discussion has to do with maintenance, and concludes a series of articles designed to furnish a **Manual** to be used in connection with the lectures which will be given to Veterans to assist them in planning and caring for the grounds surrounding their newly acquired homes.

The basic feature of any small home landscaping is found in the lawn.

Lawns and their care is a subject of sufficient importance to justify a separate treatment, so we will leave that to another and mention a few other important

things to consider in maintaining good home grounds.

Let's consider the trees and shrubs. In late March or April while everything was still dormant, you should have been quite busy. All broken branches should have been clipped off without leaving projecting stumps; trees and shrubs that were getting "out of hand" should have been restrained — with restraint on your part—and any leaves underneath the shrubs should have been scratched ("cultivated") beneath the surface, in order to preserve moisture and to return beneficial elements to the soil. (Incidentally, it makes the yard look better groomed, too!)

Various numbers of **THE GREEN THUMB** have given hints on pruning deciduous (non-evergreen) trees and shrubs. **Don't** take out all the new stems. This makes a leggy, top-heavy

shrub. Usually it is better to remove a part of the old stems. This stimulates the shrub and gives a good "body" to it. Splendid examples of correct pruning are to be seen along Denver's Seventh Avenue Parkway. **Don't** round off the top as the army barber does when giving a burr hair cut. The character and bloom are both lost that way. If you don't know whether the shrub blooms on old wood or new wood, play safe by postponing your pruning until immediately **after** the bloom is over. Don't be afraid to dig up and throw away a tree that is too large, or is deformed, or a shrub that is leggy and scrawny, or injuring others by reason of its too great size. This also furnishes fire-wood for the grate, and fire-wood is very difficult to acquire now. (See index in November, 1946 Green Thumb for articles on pruning.)

Spruce trees and all erect Junipers (usually called "Cedars") should be sprayed with lime-sulphur while dormant, (early April), and American Elms should also be given a spray. Examine the Dogwoods, and if they show black patches in branch crotches, give them a dormant spray too. Aphis will emerge from those clusters later.

Spade up the annual beds, putting in some old manure, and cut all tops off the perennials, dividing the roots when they show signs of getting too old and large. When all this has been done, and the season's planting too, you can coast—for a short while. With the first really sizzling hot day in June, however, every aphid and red-spider who was not caught by the dormant spray will start sucking cedar sap—and propagating. If you didn't use a dormant spray, in about three days the whole inside of your

cedar will begin to drop to the ground and it will have the unhealthy, brown appearance typical of insect infestation. Don't wait for this to happen. Spray, or better still, have a professional with a power spray douse the cedars with soap and nicotine the first day the thermometer reaches 90. Do this even if you used a dormant spray in the spring. You probably didn't get all of them.

(See November, 1946, Green Thumb "Dormant Spraying" by Paul Morrow.)

Weeds now start poking their heads out, and they are much easier to eradicate while small. Keep after them until frost!

The summer progresses. Cut the annual blooms, to keep them blooming. As perennials go to seed, cut off the seed pods. "Setting" seed takes a good deal out of a plant.

In late July, or early August, divide all iris plants that have been in three years. Weed all flower beds and shrub borders. Look over everything for bugs and spray when you find them. Keep the tops of fall blooming perennials like Chrysanthemums "pinched" off to make them compact and bushy and start washing the under side of phlox leaves with a reasonably stiff water spray to keep aphid off. Watch for mildew on the leaves of flowers, spraying with Bordeaux mixture when you find it. Avoid sprinkling flowers; irrigate the soil instead.

If all these practices are continued until frost, you will have had a fine yard and will have acquired considerable health. No yard can be completely satisfactory without a lot of old fashioned, manual labor. As one very wise man said (I have forgotten who), "No one can truly appreciate flowers until he has gotten down on his knees before them."



A GOOD LAWN IS THE FOUNDATION OF ANY LANDSCAPE PLAN
Home of Mr. and Mrs. W. H. Ferguson, Cherry Hills.

LAWN MAKING AND MAINTENANCE

By PAUL MORROW

THE lawn is the foundation of practically all landscaping. Good planting will avoid years of headaches in caring for the lawn, so a few suggestions of what constitutes good lawn making are timely.

All soils should be spaded at least 6 to 8 inches deep; more depth is beneficial. This will avoid some run-off and provides a reservoir for quick absorption of water to such depths that will encourage deeper rooting of the grass plants.

As spading is done, thorough and uniform pulverization of the soil should be accomplished.

Working lumps beneath the surface instead of breaking them up is poor practice and will cause a series of problems; such as difficult raking, uneven settling of finished lawns, irregular absorption of water and chemical elements, resulting in increased maintenance and a rough spotty appearance.

Kentucky blue grass has proved itself the most hardy lawn grass in Colorado. With a minimum of care and expense it will produce the most beautiful lawn. (Where more expense and care is not an item, one of the bent grasses may be considered for a

more striking effect. See article by Frank Harris in Sept., 1946 issue). This will take lots of abuse and is well suited to Colorado soil and climate. It has given Denver the reputation of having the most beautiful lawns in America. There are many lawn mixtures on the market, but with few exceptions they are not to be compared with or recommended in preference to Kentucky blue grass.

Should I mix white clover with blue grass? It has been my practice for many years to add one pound of white clover to ten pounds of Kentucky blue grass. White clover germinates quickly and provides a nurse crop for the more slowly developing blue grass. Clover being a legume, also helps in another way to establish a dense lawn quickly. After the lawn is well established, white clover can be easily eliminated. However, lawns can be started successfully without white clover by using greater amounts of mulching and more intense care over a longer period of time. Clover also helps to give quicker ground coverage and to hold the soil in place and prevent shifting and tracking by the lawn mower for the first few mowings. This is especially true on slopes and banks. Sometimes such grasses as rye, western wheat and others are used for nurse crops in lawns, but I prefer clover because it can be more easily eliminated when it is no longer wanted.

WHEN TO PLANT

Lawns may be sown from early Spring to late Summer or early Fall. It is sometimes difficult to prevent the surface area from drying out and damaging germination in the hottest part of the summer. Freshly sown lawns are quite often infested with annual weeds. These weeds will be

present to a certain extent regardless of the kind of fertilizer used. It is only normal to have weed growth whenever and wherever a seed bed is prepared. For this reason, I prefer seeding a lawn in the latter part of August. Most weed seeds on the surface have germinated by this time and most new weed seeds are not mature enough to germinate. However those seeds that are present will germinate and develop weed seedlings that will soon be cut down by frost, leaving a clean weed-free lawn without a lot of hand labor. I recommend using 1 pound of seed per 100 square feet of lawn.

MAINTENANCE

We shall now consider the lawn well established and ready for routine maintenance. And since it seems that the spirit, or the first warm days of Spring, causes man to come from hibernation and invariably get a rake and start scratching the lawn like it had the hives; for no greater reason than that, we will start the maintenance discussion with, "why rake the lawn"?

Raking is often done for the purpose of aeration. I question if there is any benefit from raking as far as aeration is concerned. If the rake teeth penetrate the soil deep enough to provide adequate aeration, the forward motion of the rake would pull out or seriously disturb a lot of the grass roots. In addition to making the lawn surface irregular and bumpy, I think this practice is injurious to the grass plants. It also removes the organic residue from the grounds surface that has become a protective mulch. This mulch if left alone will provide fertilizer, correct physical impurities of the soil, retard run-off of water and prevent evaporation of moisture.

If the lawn is mowed to the correct height, the appearance of this mulching will never be offensive. Raking is also done to remove surplus barnyard manures, litter and debris. In this it has its greatest justification. I recommend that this be done lightly and without too much disturbance to the grass. If the brown tips of overwintering grass are objectional you will find the lawn mower with the catcher attached at the time spring growth starts, very effective in removing it. Serious matting and crusting may be helped by raking. However in most cases spiking or forking will be more beneficial. Raking is also done for crabgrass control. There again the benefits of such efforts are quite limited.

FERTILIZING

The question of when, how, how much and what kind of fertilizer to use, has been one of considerable controversy; and I am sure that the last word has not been said. There are two definite fields of thought. The inorganic and the organic, often referred to as Commercial (chemical) and Barnyard fertilizer.

Over a period of several years, I have arraigned myself with both groups; worked stubbornly to prove my contentions, until my own experiments put me on the fence. The outcome of the experiments have convinced me that the best results are obtained by a wise combination of the two.

The chemical fertilizers have an advantage in so far as their analysis can be adjusted to fit special needs, such as soil deficiencies and meeting the requirements of certain plants. But due to the lack of soil organisms and humus in chemicals, lawns that are continually maintained with

them are very likely to become hard, less susceptible and retentive to water. As the humus content of the soil gradually lessens, the waterholding capacities and aeration possibilities are so drastically reduced, especially where there is any amount of traffic, to cause packing, so that oxidization of fertilizing elements and normal function of soil organisms becomes most difficult. This condition usually results in the gradual thinning and reduction in growth, and less resistance to general abuse and drouth.

Organic or barnyard fertilizers are still the most commonly used, and come more close to filling the job in an arid community. In dry climates, the foliage production on plants is comparatively light. This causes the annual deposits of vegetable matter in our soils during the many years of their development to be less than is necessary for good gardening soils. Because of this, organic manures should be a liberal part of any fertilizing program in the Rocky Mountain area.

The chemical content of organic manures is not high enough in some elements to correct certain soil deficiencies that impair the best growth of plants. So, at the present time, the nearest approach to correct fertilizing, is the combined use of both chemical and organic materials.

The availability of the fertilizing elements in organic manures, depends upon the process of decomposition. Further breakdown of manures spread on lawns can only take place after the fertilizer and soil has made such contact and absorbed sufficient moisture to enable decomposing bacteria to function normally. For this reason organic fertilizer

should be put on well ahead of the growing season. Fall or mid-winter is very good.

HOW MUCH FERTILIZER

The amount of fertilizer to be applied is of prime importance. Heavy applications no doubt supply more fertilizing elements, and is likely to last longer, but has dangerous possibilities. It is a common practice to fertilize heavily and only once every several years. This may be sound economically, but is not a good fertilizing program. Heavy applications of fertilizer provide the necessary mulch to form an excellent seed bed to germinate obnoxious weed seeds. Too much organic material is an attraction for night crawlers. Serious burning may also result from too generous amounts of fertilizer of either the chemical or organic.

Light applications spread more frequently, will produce cleaner, more uniform growth and without the offensive appearance that you get with larger quantities.

The soil condition quite often varies, causing spotty lawns. It would be well to retain a small amount of fertilizer to treat weak spots and corners where packing may take place.

Chemical fertilizers are readily available to the plant and may be applied during the growing season. I have found it quite satisfactory to divide the recommended amount into three separate applications. Early May, July and August. This removes the flash usually experienced with chemicals and provides a uniform growth throughout the season. This also lessens burning possibilities. As most soils in this area are low in phosphorus, commercial fertilizers with a high phosphorus content should be selected.

The best equipment for spreading chemical fertilizers that I have found is a seeder used on farms for sowing small seed and grain, called Cyclone Seeder. This gadget is very inexpensive and can be purchased from most all seed stores. This seeder will enable you to reduce the spread so thin that you may crisscross the area in two or more directions in getting on the desired amount. This helps to improve the uniformity of the spread.

It is quite difficult to fix quantities of fertilizer to use on a given area as the analysis of different fertilizers vary. Also the need of lawns are not the same. The best guide for fertilizer quantities is the rate of growth of the grass.

I would like to emphasize the importance of well rotted manures, well past the stage that would be attractive to night crawlers. The presence of new weeds shortly after fertilizing is not always a true indication that the weeds came from the fertilizer but that the seed had been deposited on the lawn by wind or otherwise before the lawn was spread with fertilizer which supplied the necessary coverage for germination.

MOWING

The height and frequency of mowing gets too little consideration. Short mowing looks more groomed, but as the foliage constitutes the digestive system of all plants, it is easy to overdo. On the other hand when the grass gets very long, jointing, seed development and maturity of the plant takes place. Long grass does not stool or send up additional shoots from its roots. This causes the lawn to become thin and unattractive. So it seems that a happy medium is the best course to pursue. I like to set the lawn mower to cut at about

1½ inches. This height is sufficient to shade the ground thus helping to prevent evaporation of moisture, looks well groomed and hides the clippings very satisfactorily. Blue grass does not joint or form seed at this height. Lawns mowed at 1½ inches develop a very dense turf and are resistant to infestation of weeds. When lawns are continually mowed short, heavier feeding of readily available fertilizers will be necessary to maintain a vigorous condition.

How often one should mow the lawn varies with different lawns and also as to the time of year. Lawns where the clippings are being dropped, mowing should be done at least every five days and in some cases twice a week. Where catchers are used a longer time between mowing may be allowed.

If grass gets too tall, the bottom becomes bleached and tender. This causes the lawn to have a yellowish cast when mowed. When clippings are to be dropped, they should not be longer than two-thirds of the length of the remaining grass. This will permit the clippings to fall between the standing grass blades and disappear from sight more readily than long clippings which often gives the appearance of a freshly mown hayfield.

The dropping of clippings has several values. The clippings form mulching that retards runoff water, slows up evaporation of moisture and prevents drying and hardening of the soil.

As the clippings decay fertility and humus is added to the soil. This is also an aid to the increase and function of soil organisms. Where the dropping of clippings is objectionable, these benefits may be obtained by the application of organic fertilizer. One other benefit derived from drop-

ping the clippings is the time saved. It takes only about half as much time to mow a given area without the catcher.

WATERING

The ease of turning on the hose and letting it run, the relative inexpense of water and the varying moisture conditions under which plant life develops create a combination of factors that permit us to irrigate our lawns without much concern. While blue grass will grow under a wide range of rainfall or moisture in the soil there is a place in that range where blue grass will flourish and the undesirables have less opportunity to establish themselves. It has been my observation that each form of plant life develops best at some particular moisture content level. Some plants thrive over a wider range than others; blue grass enjoys one of the widest ranges of our ornamental plants. Once blue grass is well established, it is possible to regulate the application of water to the full advantage to the lawn and at the same time eliminate most all obnoxious growth. There are two very important factors to consider in the application of water on these lawns; the quantity of water applied and the frequency of applications. The quantity of water to apply (which is usually determined by the length of time a hose is permitted to run on any one setting) should be sufficient to thoroughly saturate the soil for 5 or 6 inches. The amount of water and the time required to do this varies on different soils. This may be accomplished in ten minutes on a very sandy soil, while the heaviest of clay may require an hour. This depth of penetration is necessary to obtain deep rooting of the grass plants which assures the plants of a

greater range in which to obtain their liklihood and protect them against wilting when hot days arrive. In hot weather the bottom 3 inches of the first 6 inches of moist soil, is worth twice as much as the top three. In order for grass plants to benefit from the deep moisture, deep irrigation must be practiced constantly. Grass roots cannot adjust themselves from the surface area to a greater depth in a short time.

Water starting to run off the surface of banks and heavy clay soils is quite often taken as an indication that the soil is thoroughly saturated. This assumption is erroneous. Run-off on dry lawns after a few minutes sprinkling indicates a very slow absorption or too fast an application. Spiking and spreading organic mulch will aid absorption. A wider range sprinkler that will distribute the same volume of water over a greater area is most effective in preventing run-off on banks and heavy soil, merely turning the spigot down does not change the water volume and surface area ratio.

Analysis of irrigation run-off shows that a great amount of soil fertility is lost in addition to the waste of water.

How often should I water my lawn? I wish I could tell you, but let's consider a few of the factors that might help determine how often irrigation should be done. Irrigation is to replenish the loss of water. This loss takes place through evaporation and leaching. Evaporation is rapid in hot periods and slow in cold weather. It is retarded by mulching and is influenced by height of the grass. Heavy soils warm up slower which makes the evaporation rate lower than on light soils. Also such losses are much less three inches beneath the surface than on the top.

Leaching is much slower on clays and soils with a high humus content.

This all adds up to one thing. Lawns on heavy soils, those that are mulched and those that are irrigated deeply will not have to be watered as often as those on light soils or those that are sprinkled lightly. Lawns in this first classification will go through the hottest periods of our summer season with two irrigations per week without any apparent distress. A longer period of time between irrigations may be used when temperatures are lower.

Then the exposure of a given section of lawn has a great deal to do with the amount of water required. Lawns on the south of a building or on a south slope may require ten times the amount of water that a section on the north of a building would require.

The only sure way to know whether your lawn is dry or wet is to test it out frequently with some such tool as a screwdriver. If it can be pushed into the soil easily to a depth of six inches the soil is probably sufficiently moist.

There is another very important point to remember about lawn irrigation. The less often water has to be applied to the surface, the fewer obnoxious weeds you will have. Practically all lawn weeds are established from seed. Which means that favorable seeding conditions would encourage a greater number of such plants. Irrigations that are frequent enough to keep the surface wet will permit and encourage the germination and establishment of all weed and crabgrass seed that is deposited on the lawn. If sufficient time is allowed between irrigations to permit the immediate surface to become dry, most seeds will die in germination.

OUR NATIVE FLAGSTONE FITS IN COLORADO LANDSCAPE CONSTRUCTION

By ANDREW LARSON

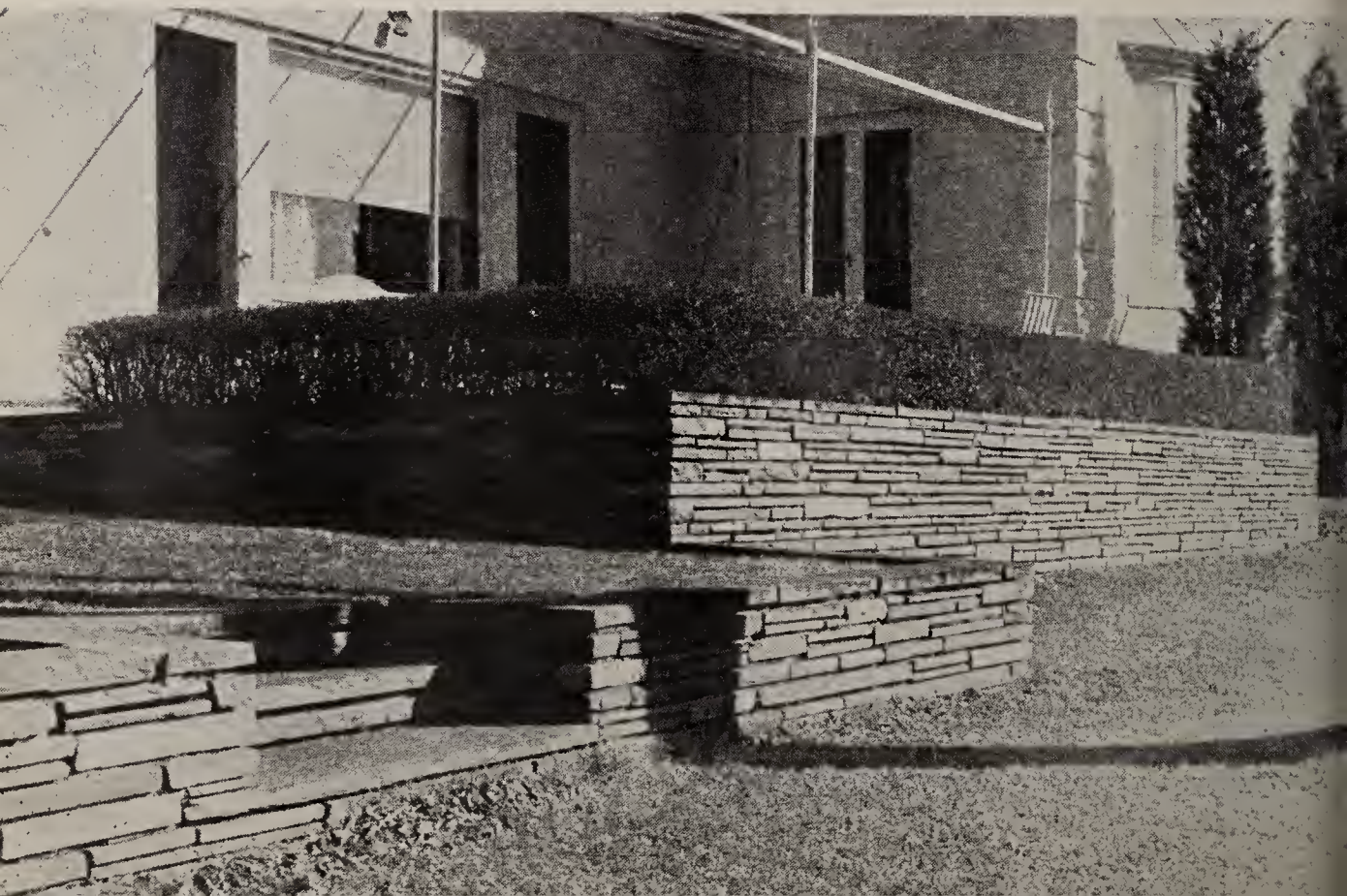
In this region, we have the native flagstone in both red and gray. The red flagstone comes from Lyons, Colorado, while the gray flagstone is found in the Loveland and Ft. Collins districts.

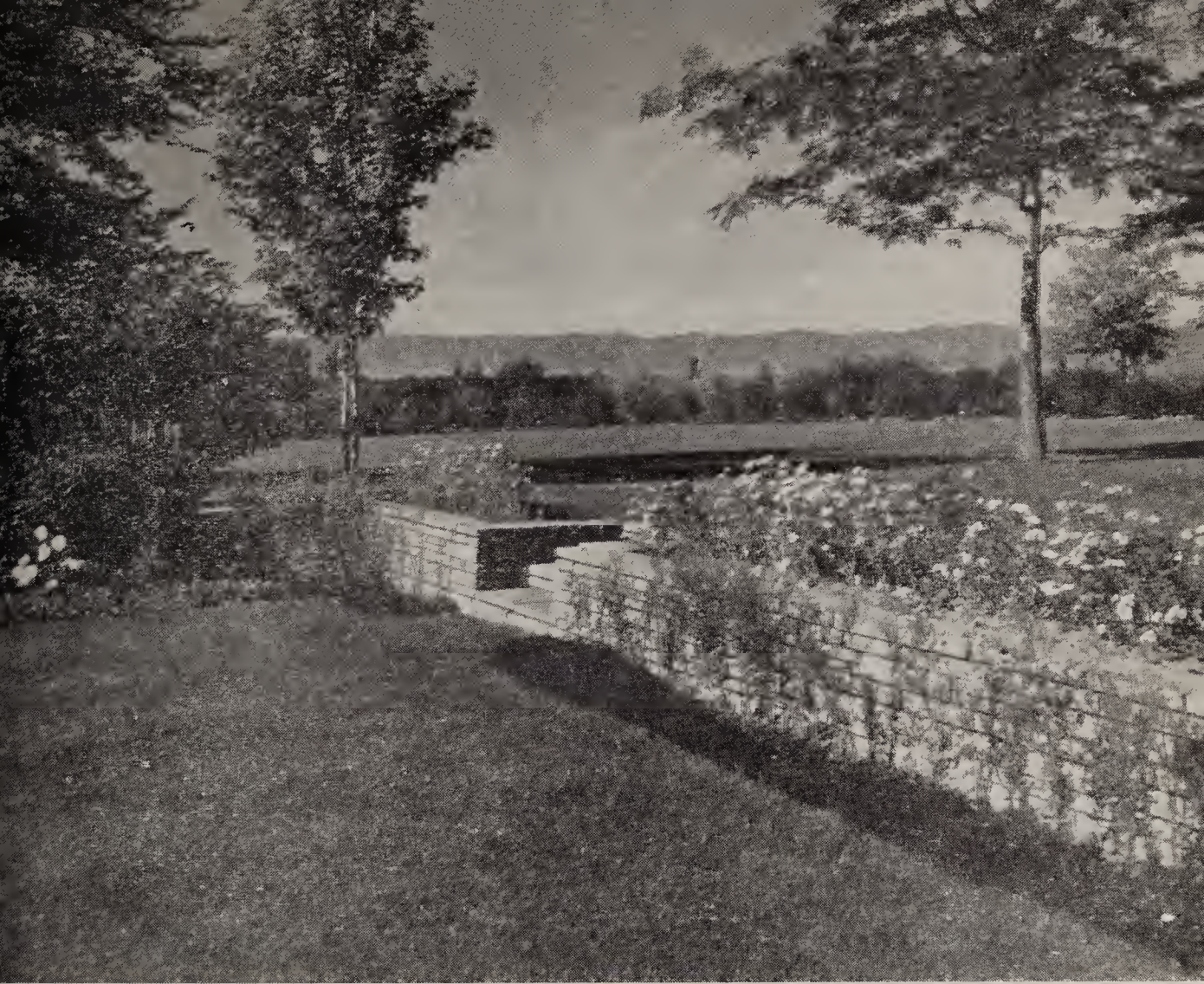
Flagstone is not a new type of construction material, as its uses date back to Denver's earliest history. Its principal use then was for the construction of public walks and curbs. In later years this use has given way to concrete, which gives better service for that purpose. However, when it comes to garden construction, flagstone excels most any material, from the standpoint of sturdy and lasting construction, as well as artistic effect. It lends itself to many garden structures, but its principal uses are as follows: Retaining Walls, Grills and Fireplaces; Terrace and Pergola

Floors, Entrance and Garden Walls, Stepping Stones, Coping for various types of walls, Drive-way Curbing and Garden Pools.

Retaining Walls constructed of flagstone will withstand the disintegrating effect caused by soil alkalinity, while most any other kind of materials will soon show deterioration. There are several ways or types of construction used in building these walls. The most commonly used is what may be called veneer type. That is, using strips of flagstone four or five inches thick, then back the same up with concrete to reach the bearing strength of the retaining wall. As a rule, a total wall thickness of ten to twelve inches will suffice, then place a coping on top, wide enough to cover the entire thickness of the wall. For the best

Well designed flagstone walls creating terraces on grounds of Mr. and Mrs. Fred M. Manning, Cherry Hills.





Effective use of flagstone wall in a sunken garden of Dr. and Mrs.
Daniel R. Higbee, Cherry Hills.

effect, the coping should be about two inches in thickness.

The stones used in this kind of wall may be either ripped or cut. If ripped stones are used, the mortar should be raked, that is, the mortar joints should be held back about one inch from the wall surface. The mortar joints are then not very visible, instead a dark shadow appears, lending a less severe structural effect. When cut stones are used, the joints should be flush and have a smooth finish.

Another type of construction is the dry wall, where flagstones are laid the full width of the wall, with soil joints, now and then, creating a soil pocket for planting purposes. However, in this semi-arid region rock wall

plantings do not always prove successful, due to drying of the plant during the dormant season.

For best effect, flagstone retaining walls should never be of any great height, 36 inches to 40 inches should be considered as a maximum. If the differences in the negotiable grade is greater, and necessary space available, a better effect is obtained by erecting two walls. The lowest wall should be of a greater height than the top wall.

Grills and Fire-places can be successfully constructed of flagstone. This type of construction requires cut stones with full and finished joints. In these structures, the fire-place and grills should be lined with fire bricks. The flues do not necessarily need

to be lined. The designs depend upon the size, use and cost. The main thing to bear in mind is proper proportions of the structure.

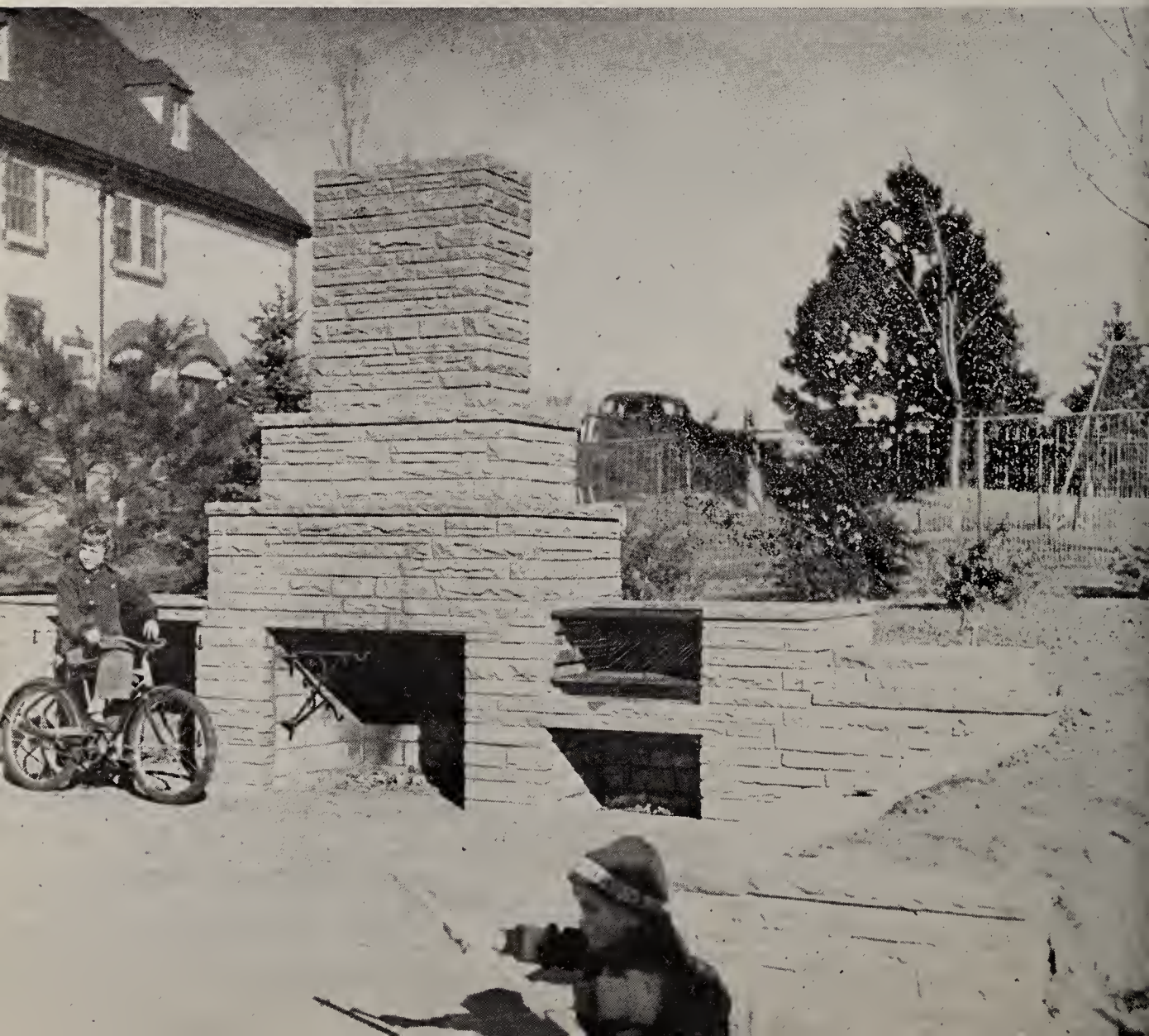
Terrace and Pergola Floors. These structures have many variations from construction standpoint. They can be set in concrete or on a sand or soil base. Where concrete is used, the base should be about three inches thick. The stone should be set when the base is poured, rather than on a pre-poured base. Often when pre-poured base construction is used, the stones are apt to come loose from the base. The joints should not be less than one inch in width, smaller joints have a tendency to crack and soon

deteriorate. It is also a good practice to pour the joints before the base is set firmly. When flagstone is set on a soil base, the stones should be of stable size, not less than one and one-half inch in thickness. If the joints are seeded with lawn grasses, the stones should be set very close. Such spacing of stones prevents heavings, caused by too many grass roots between the stones. Stones for this purpose may be irregularly shaped or cut into various types of rectangular patterns.

Entrance and Garden Walls are similar in construction to Terraces.

Flagstones are one of the best materials for copings of brick,

Flagstone fireplace at home of Mr. and Mrs. J. Kernan Weckbaugh, Cherry Hills.





Extensive use of flagstone for walls, steps, walks and platforms at home of Dr. and Mrs. R. O. Smith, Arvada. Unity in design has been achieved by building fireplace chimney and front porch of the same material.





Irregular pattern flagstone used to border pool, pave platform and construct distinctive garden entrance at home of Mr. and Mrs. Marvin Watson, Wheatridge.



cinder block and concrete walls. It can be used in its natural colors or painted to conform with any color scheme. The thickness of the coping varies with the structural appearance of the wall.

Drive Curbing constructed of Flagstone are economical, attractive and lasting. Its construction is very simple, only the exposed surface need be cut and squared and the stones set in soil and packed firmly. The buried portion should be of a greater depth than the exposed portion, that is, if the curbing is 5 inches

high, the unexposed area should be from 6 to 8 inches in depth. If set too shallow the stones will not maintain uniform lines. Curbing stones should not be less than two inches thick. The stones must be solid, as the exposure to the elements will cause any seams to open and flake off, gradually allowing the stone to deteriorate.

This article has been written with the purpose of calling attention to the many useful purposes of flagstone and it is hoped will stimulate others to experiment with further uses of this versatile native material.



White flagstone used to cap a masonry wall on grounds of Mr. and Mrs. James H. Dewson. Denver.

Walk out some moonlit night and look at the trees against the sky. Make a game of trying to identify the various kinds of trees by their silhouettes. You will find that each tree has its own individual habit of growth.

Now is the time of year that we appreciate the varying colors of bark and twig found in some trees and shrubs. The Redwig dogwood is very attractive, the Golden Willow makes splashes of yellow and the Bolleana poplars make a good contrast with their silvery green bark. There is even an interesting variation in the more somber grays and browns.

FARM FORESTRY PAYS

Extract from an article by John F. Preston, in "The Land."

"Getting farmers to accept wood as a farm crop and the woodland as an integral part of the farm, is necessarily a slow process. But we are making progress with 'green agriculture'. We will soon begin to note progress in 'forest agriculture'. It is no less a job than building into the tradition of farming the idea that a farmer can use and develop and make an income from the forest that his forebears tried so hard to get rid of. Farming the woodland can be done with less physical effort, with less risk of loss of the soil itself than is involved in clean-tilled crops, and the farmer has the permanent protective influence of woodlands on croplands. To assure the permanence of American agriculture, as well as the well being of farmers, farm forestry must find its place in farm economy. Wood must be recognized and grown as one of the farm crops on lands dedicated to that use."

SOIL, FORESTS, WATER

"Akin to our problem of soil loss is the problem of our diminishing forests, and akin to both is the problem of water. The Forest Service tells us that between 1909 and 1938, a period of only thirty years, our standing saw timber was reduced 40% and in 1943 timber cut or destroyed was 50% more than total growth. (Some plain facts about the Forests, Misc. Pub. No. 543, U. S. Dept. Agriculture, Forest Service, April 1944, pp 2-3). At these rates of exploitation our forests aren't going to last very long, especially as time is measured by history. And, if our forests go, so will go much of our soil and water reserves, our wild life and many of our recreation spots. These rapid rates of cutting or destruction of timber come at an unfortunate time — at a time when the United States needs lumber to build millions of new homes, and for countless other postwar uses."

—Guy Irving Burch,
in THE LAND.

LANDSCAPE DESIGN OF THE COUNTRY HOME "The Plan's 'The Thing'"

By Ralph B. Riclefs, of the Kansas Landscape and Nursery Co., Salina. Kansas.

The first requirement for **old homes** or **new** alike is to have a plan for the grounds—a program to be carried out for functional as well as attractive development of the farmstead.

Planning the farm home differs but little from that of the city home. Space saving may not be so important, but often the arrangement of the various parts of the farm grounds—for example, the grouping for convenience of barns, windbreaks and yards may be more important than the several related parts of a town yard.

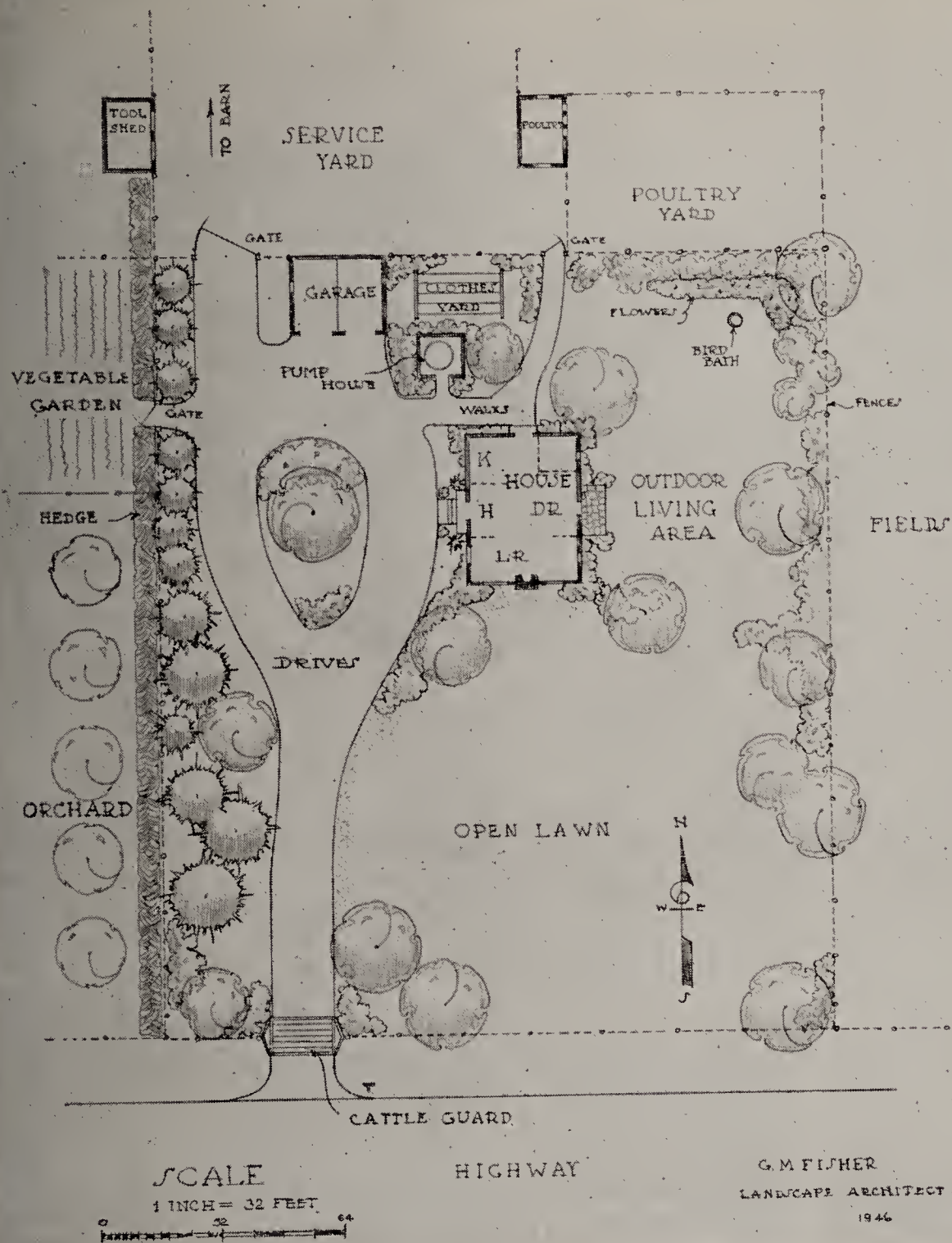
Certainly the surroundings of the country home need be none less beautiful and inviting than

those of the city lot. Breadth, informality and simplicity are characteristics of the country side. Thus, these factors combined with neatness should mark the appearance of the country home.

Don't make the mistake of just following a "hit and miss" landscaping and building up the grounds "piecemeal" without any thought or purpose before they are planned. Instead, plan what is to be done and what arrangement serves the best purpose; using proper foresight along with your general farm planning and improvement program.

A correct plan, embracing the whole program for the farm

A DESIGN FOR A KANSAS FARMSTEAD



grounds, is needed at the outset, whether it can be put into execution at once, or is completed over a period of years. Often it is just as well to extend the planting over several seasons, following a logical sequence in which the various units are developed.

With a well - thought - out "master plan", the convenient and economical budget system of landscaping may be followed. The grounds will develop as the plants grow into beauty and usefulness along with the farm owner's enthusiasm.



MORE PLANTS FOR THE PLAINS

By GEORGE W. KELLY

THE Colorado Forestry and Horticulture Association aims to be of service to all parts of the state. A large proportion of the state is included in the Great Plains area. This area will probably never support a large population, yet we feel that with improved methods of culture, the restricted rainfall can support many more than at present. What is much more important is that those who now live there can develop systems which will enable them to establish more pleasant homes and communities. We have recently made several trips through this area to supplement previous knowledge of the conditions with later data. In general, the climatic conditions are about the same over the whole Central Plains region: roughly that area between the foothills, Central Kansas, the Arkansas valley and the Nebraska line.

Of course the first consideration here must be to obtain a "living" from the soil. Too little

attention has been given in the past to making homes which were worth "living for". There has been very largely a feeling of "stick around until we make a bumper crop and then get out". We must promote means of correcting this attitude and establishing permanent homes here in which our children and grandchildren will be happy to live.

Agriculture is concerned in making this "living", but nothing will help to make this country worth "living in" as much as horticulture: trees, shrubs, fruit and flowers. Much the same climatic conditions affect both agriculture and horticulture, and as more has been done towards solving the agricultural problems of the Great Plains we will start from there in developing plans for horticultural improvement.

The Field Station of the U. S. Department of Agriculture at Akron, Colorado, has been experimenting with methods of getting the maximum crops from this region for some thirty-seven

years so they have been able to develop some theories of the most efficient methods of cultivation. We find its recent publication, identified as Circular No. 700, issued in May 1944, by J. F. Brandon and O R. Mathews, confirming excellently our own observed conclusions about plains agricultural and horticultural practices.

It has long been thought by many who have studied the plains agricultural problem that the type of agriculture best suited to the area as a whole is livestock raising supplemented by the production of food and feed crops. The emphasis on crop production, however, may vary widely, and there are many successful farmers who rely chiefly on grain. This is our view and is confirmed by conclusions in the mentioned U. S. circular.

PRECIPITATION

It has also been recognized that **PRECIPITATION IS THE GREATEST SINGLE FACTOR IN CROP PRODUCTION** in the western part of the Central Great Plains., However this is the first time that the west Central Plains have had a careful analysis of the distribution and intensity of its rainfall over so long a period. It allows some logical conclusions. In this area insufficient soil moisture regularly limits crop yields.

This analysis of the station rainfall from 1908 to 1938 shows that 29.7 percent of the total precipitation falls in rains of one inch or more. This is the precipitation most likely to be lost by runoff, and while it may not be possible to hold all of it on the surface until it can infiltrate into the soil, the importance of pre-

venting avoidable losses is apparent. Thus the **PREVENTING OF RUNOFF**, which is largely controllable, **IS ONE OF THE GREATEST FACTORS IN CROP PRODUCTION** in the West Central Great Plains area. The average annual precipitation for the entire thirty-one year period at Akron was 17.9 inches.

WIND EROSION

Wind erosion has been acute in the area in years past, and certain facts about this problem need to be emphasized. All agree that after soil starts blowing on a field it cannot be arrested until the surface is severely roughened or is covered with growing crops or weeds. It must be prevented, however, and can be by adequate cover of dead or dormant vegetative matter, and generally by suitable cultivation. Management to prevent or control soil blowing, this circular points out, is a necessary part of Great Plains rotations. If fallowed land seeded to winter wheat should not grow a protective cover that fall, soil blowing is almost sure to be encountered. Thus in known troublesome areas winter wheat on fallow should not occupy too large a percentage of the farm area. It is just possible that the weather of the Plains area flows in cycles, and that once proven by the Plains research units, farmers can be advised when they are less likely to obtain good protective cover of winter wheat in their large fallow areas.

FALLOW

In the past ten years there have been many methods and systems of fallow maintenance advanced before Plains farming audiences. This U. S. circular

based on findings at the Akron, Colorado U. S. station, seems to bring order out of chaos by listing four major requirements to be met in maintaining good fallow for winter wheat in this general region: (1) To enable precipitation to enter the soil; (2) To conserve this soil moisture; (3) to have the top horizon of the stored moisture near enough the surface by fall to permit seed to germinate and; (4) to have a surface maximumly resistant to soil blowing. Timeliness in performing all necessary cultivations, and use of implements that leave the surface not only free of weeds but open and cloddy are of primary importance in attaining the first two objectives. Cultivation during the forepart of the fallow season with implements that form small basins is recommended. The use of shallow working implements during the latter part of the fallow season is necessary for the third objective. The use of implements that leave the surface cloddy and with trash and debris on top in cultivation to control weeds, and the use of furrow seeding machines meet the fourth requirement.

CULTIVATION

In their cultural investigation work at Akron over this 30 year period it was conclusively shown that the purpose of all Great Plains cultivation is to control weeds, to keep the surface in condition to resist soil blowing, to permit ready penetration of rainfall and to have a suitable seed bed. Deeper or more frequent cultivation than is necessary to obtain these objectives serves no useful purpose and may do real damage by fining the surface so as to induce soil blowing danger.

ROTATIONS

Rotations naturally should include the crops best adapted to a region, and these should be grown in an orderly plan that permits most economical production. Rotations, besides systematizing the farm activities, permit crops to follow each other in sequence that take advantage of existing moisture conditions.

LIVESTOCK

After 30 years of investigation this Akron Agricultural unit concludes that any well diversified rotation for the section presupposes livestock and an acreage of native or seeded grass for pasture. The Colorado Agricultural Experiment Station recommends that on the hard lands at least 25% of the farm unit be in sod lands with lower productivity and that the percentage be increasingly higher with greater sandiness of soil. The percentage of sod should be higher on lands with lower productivity ratings. Naturally the quantities of bulky feeds that must be grown depend upon the extent to which they are supplemented with pasture... Over much of eastern Colorado the main dependence of the farmer should be on livestock unless crop-weather cycles are proven, when a different pattern of farming may be advisable over each type of cycle.

CONTOUR AND STRIP CROPPING

Fields can generally be arranged so that contour cultivation and strip cropping can be followed. A rotation involving strip cropping may sound very complicated when described, but it is relatively simple in field operation. Effort should be made to incorporate such a practice if it can be done without increasing insect damage and if the direc-

tion of the strips does not parallel that of the more severe winds. This excellent circular points out that **THE REGION NEEDS TO BECOME EXTREMELY CONSCIOUS OF THE NECESSITY FOR RETAINING AS MUCH AS POSSIBLE OF THE MEAGER RAINFALL IN THE SOIL. RAINFALL STORED IN THE SOIL IS THE LIFEBLOOD OF SUCCESSFUL GREAT PLAINS AGRICULTURE.**

Other data that this bulletin brings out are the fact that there are usually quite a number of days in the summer when the temperature goes above 100, that there is normally a high evaporation rate, that the winter temperature frequently goes well below zero, that the average frost free period is 144 days, and that there is considerable variation in cultural practices on different types of soil.

There are also soil conditions which make the raising of certain plants difficult. Much of this area has an excess of alkaline salts in the soil which induce chlorosis in susceptible plants such as spireas, maples and barberries.

Here then we have a pretty good picture of climatic conditions and recommended cultural practices. These general recommendations will apply, in modified forms, to all horticultural operations. Unfortunately horticultural investigations have not been a major field of investigation at the Akron unit, either through the Federal Government or through Colorado State College cooperation. The station, however, has several good horticultural and forest variety survival and production studies.

MORE PLANTS FOR THE PLAINS

So, starting from here, what are the necessary steps in the development of improved and increased horticulture?

1. A systematic plan for each home showing where various trees, shrubs, fruits and flowers are needed to provide shade, wind protection, screening, firewood, posts or beautification.
2. Plant first those trees, shrubs, fruits or flowers that have shown a high resistance to the Great Plains climatic conditions. See list below.
3. Gradually add plants of better kinds but less hardiness, in the protection of the established older plants. Also arrange to give new plants extra care, such as watering, shading and windbreaks.
4. Conserve the greatest proportion possible of the rain and snow that falls, by proper preparation of the soil, proper cultivation, effective removal of competing weeds, contour cultivation, sodding and ditching to divert runoff to plantings.
5. Construction of dams in suitable places to catch runoff and enable it to be used where needed later.
6. Development of wells and pumps to get the maximum benefit from any available underground water.

It is evident that quite a lot of planting has been done around homes in this area in the last few years, but there are still many places with no trees, and a large proportion could well grow many more plants than they now have, and also a greater variety. We



Typical unplanted plains farmyard common a few years ago.

have made an effort to locate those progressive residents who have gone a little ahead of their neighbors and have succeeded in growing many things that the average resident does not have. Through these pioneers we can demonstrate that others can also raise a greater variety of plants if they care to give the thought and effort to it. We are also sure that any effort and expense toward this end will not only bring a proportionate reward in the satisfaction of more livable homes, but in actual financial gain. A more pleasant home is sure to give the inspiration to work harder and more efficiently on the pay crops.

HARDY "FOOLPROOF" PLANT TO START WITH

TREES—

Siberian (Chinese) Elm
Hackberry
American Elm
Native Cottonwood
(Good where there is an underground watertable)
Boxelder (Subject to bug injury)
Honeylocust
Russianolive
Green Ash (Short lived)
Mulberry (For southern part

of Plains area only)

Osage Orange (Not hardy in northern Plains area)

EVERGREENS—

Ponderosa Pine (Very good)
Rocky Mountain Juniper (Very good)
Pinyon Pine
Limber Pine
Austrian Pine
Bristlecone Pine
Oneseed Juniper

FRUIT—

Sour Cherries
Early Apples
Mulberries
Sand Cherries
Chokecherries
Currants

SHRUBS—

Tamarix Hispida
Siberian Peashrub
Common Lilac
Persian Lilac
Vanhouette Spirea
Sumac
Native Flowering Currant
Native Wax Currant
Russianolive (Some winterkill in northern part)
Bush Honeysuckle
Wild Plum
False Indigo
Yucca
Wild Rose
Chokecherry



Shows part of the windbreak on the Peter Loos farm near Fleming.

—Cut courtesy State Forester and U. S. Forest Service.

ANNUALS—

Zinnas
Petunias
Marigolds
Calendulas
Cosmos
Portulaca
Four o'Clock

VINES—

Engleman Ivy
Native White Clematis
Halls Honeysuckle

PERENNIALS—

Shasta Daisies
Iris
Sunflower
Fall Asters
Chrysanthemums
Goldenrod
Day Lilies
Salvia
Achillea
Saponaria
Hollyhocks
Flax

DESIRABLE PLANTS TO ADD LATER

TREES—

Black Walnut
Willows (Scraggly growth)
Soft Maple (Short lived)
Kentucky Coffeetree
Catalpa (Winter kills in north-
ern part)
Carolina Poplar
Lombardy Poplar
Silver Leaf Poplar
(Poplars all must have under
ground water or surface ir-
rigation).
Bur Oak
Tree of Heaven
Linden (Not hardy in northern
part)
Sycamore
Bechtel Crab (Need special
care)

FRUIT—

Peach (Hardy only in favored
locations)
Apricot (Rarely sets fruit)

Apples

Plums

Manchu Cherry

Gooseberries

Everbearing Raspberries

Everbearing Strawberries (Berries must have lots of water)

Buffaloberry

SHRUBS—

Privet

Elderberry

Snowball

Snowberry

Coralberry

Forsythia

Shrub Roses

Flowering Almond

Flowering Quince

Flowering Plum

Redleaf Plum

(Last four need care like orchard trees)

Redosier Dogwood

Leadplant

Buddleia

Japanese Barberry

Mockorange

Hawthorn

Rock Spirea

Althea

Pin Cherry

Hibiscus

Buffaloberry

Redbud

EVERGREENS—

Douglas Fir (In favored locations)

Pfitzer Juniper

Savin Juniper

Mugho Pine (Winter burns in exposed places)

Blue Spruce (Need extra care)

Chinese Arborvitae
(For southern part)

VINES—

Purple Clematis

Goldflame Honeysuckle

Boston Ivy

Climbing Roses

(All above need protection)

PERENNIALS AND BULBS—

Peonies

Phlox

Dahlias

Gladiolus

Lilies

Delphinium

Bleeding Heart

Columbine

Coreopsis

Dianthus

Gaillardia

Goldenglow

Liatris

Monarda

Pentstemon

Poppies

Violas

ANNUALS—

Verbena

Stocks

Salpiglossis

Sweet Peas

Larkspur

Nasturtiums

Nicotiana

Morning Glory (Very good)

Phlox

Asters

Sweet Alyssum

Snapdragon

Calliopsis

Celosia

Centurea

For characteristics and particular uses of the plants here listed see previous lists published in "The Green Thumb".

We are indebted to Mr. J. F. Brandon of Akron, Colorado, for checking the above information.

—Editor.

FOREST SURVEY ASSURED

IN the last issue of the GREEN THUMB reference was made, in an article entitled: "FORESTRY ON THE MARCH", to a proposed forest survey.

I am sure it will be welcome news to the readers of the Green Thumb that this proposed survey by the Society of American Foresters and the Charles Lathrop Pack Foundation is assured, and will soon become a reality as evidenced in the following quotation from a letter which I have received from Mr. Henry Clepper, Executive Secretary of the Society of American Foresters:

"Doubtless by this date you will think that I have completely forgotten you and our previous conversations about a State forestry survey in Colorado. Following receipt of the Governor's invitation I took the matter up with our steering committee and asked them to approve a survey waiving a contribution of \$1,500 from the state. I am delighted to inform you that the committee has approved this recommendation.

The project leader likes to get around the State and interview all classes of people having an interest in or information on conservation and it seemed better to do this when the weather would be more suitable. If it meets with your approval, we can arrange for Mr. Hastings to arrive in Denver about April 1. For your information, it will take him at least two months to make the study on the ground, following which you may expect another three or four months to pass before the completed report is ready. . . ."

I am sure that members of the association will be glad to furnish any information or opinions that may help the project later to arrive at a fairer estimate of the forestry situation in our State, and what is needed to improve forestry practice on State as well as privately owned lands.

—By EVERETT J. LEE,
State Forrester.

The Colorado Forestry and Horticulture Association has just taken out an affiliated membership in the American Horticultural Society, Inc., (821 Washington Loan and Trust Company, Washington 4, D. C.). By virtue of this affiliated membership, all members of our own association are privileged to become members of The American Horticultural Society at \$2.00 per year instead of the regular rate of \$3.00 per year. All members of The American Horticultural Society receive its splendid magazine, (National Horticultural

Magazine), one of the outstanding magazines in the field.

—o—

"There is a binding, genial and generous fellowship among the 'growers of living things.' It's a fellowship that has spread with man over the earth—since he discovered that by carefully planting and harvesting crops he could enjoy relative plenty. Left to his own, the Grower is a man of peace, goodwill and friendly understanding."

—George S. Avery, Jr., in
Plants and Gardens.

THE LAND

"The land is God's greatest material gift to mankind. It is a fundamental source of food, fiber and fuel. The right to use such an elemental source of life and development is essential for human welfare.

Land is a very special kind of property. Ownership of land does not give an absolute right to use or abuse, nor is it devoid of social responsibilities. It is in fact a stewardship. It implies

such land tenure and use as to enable the possessor to develop his personality, maintain a decent standard of living for his family and fulfill his social obligations. At the same time the land steward has a duty to enrich the soil he tills and to hand down to future generations as a thank offering to God, the giver, and as a loving inheritance to his children."

(From statement of principles by a joint council of religious leaders, as quoted by Eugene Smathers in *THE LAND*.)

"LIVING MEMORIALS"—BLUE STAR DRIVE

"BLUE STAR DRIVE" a naturalistic planting of dogwood, was conceived by the Garden Club of New Jersey and carried out cooperatively by the State Highway Department, as a tribute to the men and women of New Jersey who served in the Armed Forces of World War II. This type of living memorial has now been adopted by the National Council of State Garden Clubs, to be sponsored in several states by Garden Club Federations, Conservation Groups and Veterans Organizations in cooperation with the State Highway Departments.

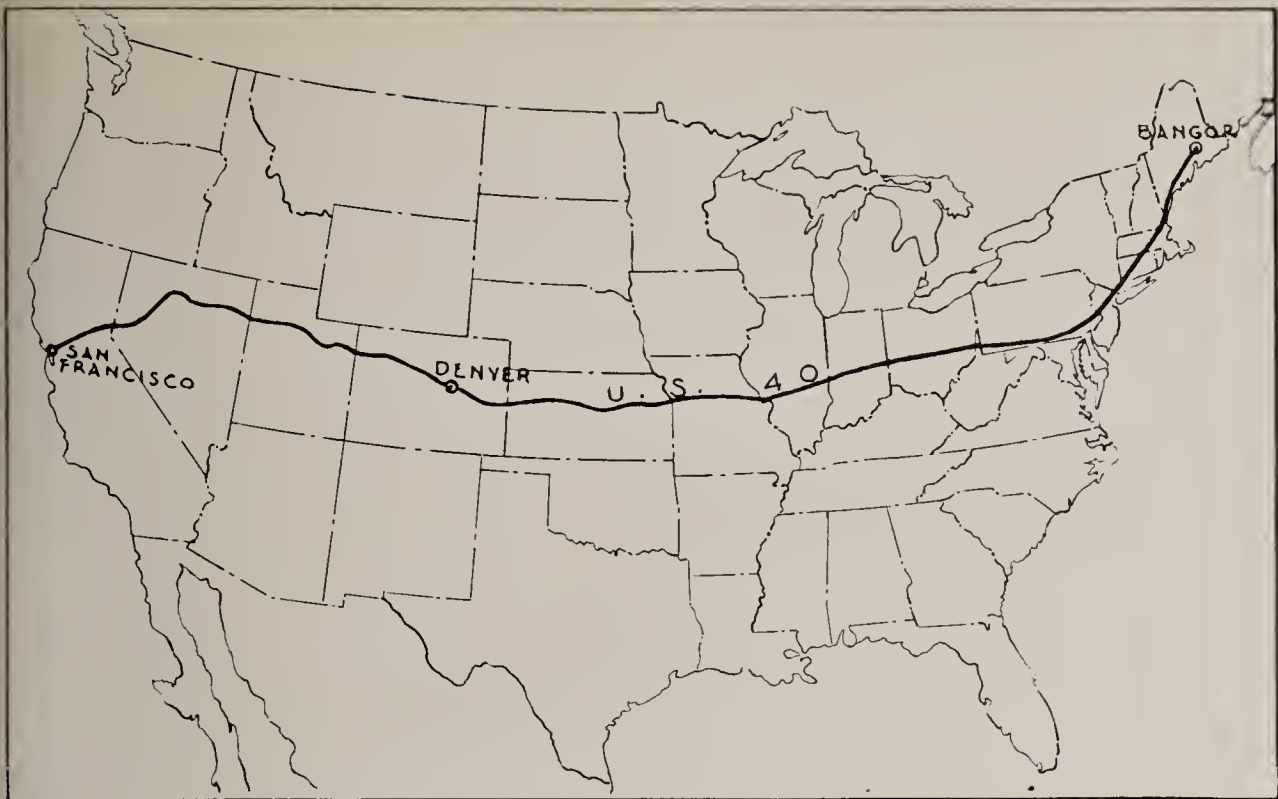
This Blue Star Drive is to be a coast to coast continuous highway, starting near Bangor, Maine, and ending at Tribute Grove near San Francisco in California. It is not proposed to have a continuous planting, but that each state should try to meet the needs most required, such as roadside parks, wayside rest areas, look-outs, bird sanctuaries, arboreums and forests. In other words each state will develop the type of living memorial best suited to the highway which is allotted for this purpose.

The Colorado Federation of

Garden Clubs, Inc., who are sponsoring the Living Memorial—Blue Star Drive in Colorado, hope, together with the help of other organizations mentioned, to carry out this plan on the highway which has been allotted to them by the State Highway Department. They plan having uniform memorial markers which will carry a message properly recognizing those who are being honored. Native trees and materials will be used as much as possible to keep costs within reason.

Past highway plantings will be studied, so we may profit by these experiences to know the locality where trees and shrubs have the best chance of surviving, and also that they are planted in places where it is possible to have them watered. Expert horticulturists are now making exhaustive study of the kinds of material best suited to the varying parts of the proposed route, and we hope to start this work of landscaping in the near future.

In planning this living memorial planting, we must be careful not to obscure any of the many beautiful views of our mountains, but to plant in a way



that will add to this beauty. Beyond all else, it is important to remember that what is being created is a Living Memorial of permanent character and lasting beauty. Such memorials cannot be built overnight: they must evolve, they must indeed grow. Slow growth is the way of nature and all true creations.

There is still another service to our land in this project, if our vast network of highways is to be kept free from the blight and decay which follows in the wake of unrestricted development of roadside businesses with indiscriminate advertising along our highways, the capital investment by the States and Federal Government will rapidly depreciate and we will later be faced with a vast task of slum clearance, not in our cities but along our major highways. If we recognize this danger and face it now, it can be a work of prevention.

There is much to be done as we enter our state from Kansas, where mile after mile of country-

side is bare and desolate. Here is an unique opportunity for the members of the Colorado Federation of Garden Clubs to demonstrate what can be done in roadside beautification, and I am sure they will rise to the occasion. Then again from Steamboat Springs on through Craig and to the Utah border much the same problem has to be faced. The Blue Star Drive through our state is Highway Route 40.

As we strive to create this Living Memorial to those men and women of our state who served in World War II, they will understand our gratitude and faith in that which they fought for. "They will see that we believe in that which they believed in;" that we have taken to ourselves their sacrifices, which has given to the world the freedom civilization now shares. This living memorial is a challenge to us to build and create a living and perpetual remembrance worthy of these brave men and women.

Mrs. F. S. Mattocks.

STRAY LEAVES IN THE MARCH WIND

IF you have a bush of the Redtwig dogwood in your yard go out now and look in the crotches where small twigs branch off and see if these spots are covered with masses of tiny jet black dots. If so, these are the immature forms of aphids which will come to life at the first flow of sap and begin to feed on the newly unrolling leaves. The leaves immediately roll around them so that hitting them with a poison spray is impossible. Get them now with a dormant spray of lime-sulphur or miscible oil. Much this same thing happens to all snowball and many euonymus, though in these cases the immature insects are not easily seen.

While you are examining your shrubs look over the Lilacs, Dogwoods and Cotoneasters for signs of oystershell scale. These are tiny things about one sixteenth of an inch long and very much resembling miniature oyster shells. Same treatment as above.

And while you are looking for scale examine your American elm trees for the elm scale. These are tiny gray spots in the cracks and joints of the small twigs. If there has been much scale damage the previous year the tree will look black and dirty and small lower limbs will be dead. The maple scale is also coming back to town. These are large wooly masses on the under side of limbs on maple, and sometimes Elm, Honeylocust and other trees. As with so many other things horticultural, the established rules do not always apply to the habits of insects in Colorado. We must insist that our agricultural college is given appropriations so that they are able to make available experts on insects damaging ornamental plants. Eastern states have done so and saved their citizens thousand of dollar in prevented damage.

With so many new houses going up now we need to be more aware than ever of the mistreatment of the soil around new homes. With all the fertilizer in the world, organic or inorganic, you can not entirely correct the damage done from allowing "Contractors soil" to be created. Demand that good top soil be saved, that the worthless dirt from the bottom of the basement excavation be not piled on top of the good soil, that plaster and various building refuse is not left in the yard and that the soil is not puddled by running over with trucks when very wet.

Look over your evergreens, especially the low ones such as Mugho pine and Pfitzer juniper for broken and partly broken limbs from the heavy snow last fall. If not too badly broken many may be braced up until they grow together again. Do not wrap string, wire or tape around the limbs unless it is loosened every few weeks throughout the summer as the plant grows and expands.

Examine your larger evergreens for double tops. The best of these may be left and the others headed back to allow the one selected to develop.

Unless it has previously been attended to, chances are there are some broken limbs in your trees. Have these stubs cut off close to the trunk or larger limb.

If much damage is found an expert should be consulted.

It will soon be time to move in the new plants that are needed.





As you drive around town notice the many horrible examples of the planting out-of-scale trees in years past. Some of those "cute little spruces" planted each side of the front walk are now great trees hiding the house and spoiling the views both in and out. To avoid this trouble we have three choices. First, plant for immediate effect and thin out as things get too crowded or large. Second, plant for ultimate effect and let the planting look a little thin for a few years. Third, plant for immediate effect and replace with smaller plants when the first begins to get too large for the spot. For most people the second treatment is the most practical.

What kind of fertilizer shall I put on my lawn? That is a question which can not be answered in a few words. For several years the practice has been to buy whatever was offered and ask no questions as to the price or quality. Now we may again begin to choose and the enthusiasts for commercial and various organic fertilizers all have their pet ideas. Some forms may do more good than others under varying conditions. If your soil was really good before the lawn was planted you will need little of any kind.

Do you realize that south slopes and areas against south walls may have become very dry since the hose was put away in the fall? Examine these spots and give them some water when there is a good warm day.

If you have gotten a start of green aphids, wooly aphids, mealy bug or scale on your house plants they will have multiplied by now until they are doing a great deal of damage. Look over the plants carefully and if necessary get out the sprayer and declare war on them.

"Winter-kill" may actually be largely fall-kill and spring-kill. Many plants which thrive in Canada can not survive our dry hot winters and erratic springs. Various broadleaf evergreens so useful in other climates are usually hopeless here because of the winter burning of their leaves.

We are becoming more conscious of the value of humus and mulching. Many advocate mulching entirely rather than cultivating. It is certain that our Rocky Mountain soil usually needs more humus. Great masses of undecayed vegetable matter put into the soil may do damage, but properly composted material will add greatly to the fertility of the soil. Right here the big argument about earthworms and organic fertilizer comes in. It is certain that earthworms need decaying vegetation in the soil to thrive, but just how much good they do is still an argued question. And then how about the lawn alive with night crawlers? There are many sides to this whole question, but as in most things we must avoid going off at too great a tangent until we are pretty sure of a sound basis for our belief.

Bolleana poplar trees are almost a thing of the past around the older communities. Nothing has been found to anywhere near take their place, but with all the blights and borers that attack them it is an almost hopeless fight to keep them. Then they are such rank feeders that if they do thrive nothing else in your, or your neighbor's yard does well.





ENGELMANN SPRUCE--Photo by U. S. Forest Service

The Green Thumb

MAY-JUNE, 1947

IN THIS ISSUE

Horticulture in the
Arkansas Valley
The Maroon-Snow-
mass Wilderness
Tall Evergreens for
Colorado Use





Cut loaned by D. Hill Nursery.

Canaert Redcedar.

*Preliminary Announcement of***ACTIVITIES AT HORTICULTURE HOUSE**

It is now possible to announce some of the privileges which Horticulture House will offer to its members. Many other plans are in the making and will be announced later in the *Green Thumb*.

You will find the house delightful. When everything is in readiness you will be invited to come and see for yourself.

The use of the library with its excellent books and its rack of periodicals is one of the finest offerings that the society makes to its members.

The house will be open daily, Monday through Fridays, from 11:30 A. M. till 5:30 P. M., and on Tuesday and Friday evenings 7:00 to 9:00. From 1:30 till 5:30 on these days, and on the two evenings, skilled consultants will be on hand to answer questions and assist members in locating information desired.

These consultants will be:

On Monday, Tuesday, and Thursday afternoons, and Tuesday evening, Geo. W. Kelly.

On Wednesday afternoon, Mrs. E. R. Kalmbach.

On Friday afternoon and evening, Mrs. Helen K. Fowler.

In the absence of any of the above, Mrs. C. Earl Davis will occasionally substitute.

There will be a panel discussion on Seasonal Problems the second Friday evening of each month. Send in your questions.

We shall, of course, continue our custom of an annual picnic in addition to the annual meeting of the Association.

As needs arise and requests are made we will attempt to arrange classes, lectures, trips and other activities related to horticulture.

Mrs. George H. Garrey,
Chairman House Activities
Committee.

ACTIVITIES SCHEDULE

The outdoor activities will include conducted trips each month for the study of native and collected plant materials; Also, a botanical collection trip will be arranged (each month) for a small party of botanists and their friends, who are willing to spend some time in collecting herbarium specimens.

May 4.—Botanical study and collection trip to the foothills. Arranged by Miss Alice Wood (Littleton 42W).

May 9.—Friday evening at 7:30. Panel discussion.

May 18.—Annual tree planting in cooperation with the Colorado Mountain club, and under the direction of the U. S. Forest Service. The location will be the Mammoth area in the Roosevelt National Forest, about 1½ miles S. W. of Tolland on the old state road between Tolland and Black Hawk. We will leave the Public Library at 7 A. M. Bring your car if possible, and register at least two days in advance so that transportation may be adjusted.

May 30 to June 8.—Botanical collection trip to the Narraguinne Wild area north of Dolores, Colo. George W. Kelly, leader.

June 13.—Panel discussion.

June 15.—Public trip to the Brainard Lake area for wildflower study. Leaders Maud Reed and Hazel Schmoll. Details can be obtained by phoning the "House."

June 28 to July 6.—Botanical collection trip to the Snowmass-Maroon Wilderness area. Some will collect close to camp while a group will backpack out to the more inaccessible spots. Leader, Mrs. Anna Timm.

July 20.—Public trip, joint with the Colorado Mountain Club. Location will be the Mt. Goliath Wild area above Echo Lake. Leader, Mrs. E. R. Kalmbach.

The Green Thumb

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COLORADO FORESTRY AND HORTICULTURE ASSN.
Organized in 1884

GEORGE W. KELLY, *Editor*
MISS ALICE WOOD, *Assistant to the Editor*
L. C. SHOEMAKER, *Treasurer and Custodian*

1355 Bannock St., Denver 4, Colorado—Phone TAbor 3410

"To preserve the natural beauty of Colorado; to protect the forests; to encourage proper maintenance and additional planting of trees, shrubs and gardens; to make available correct information regarding forestry, horticultural practices and plants best suited to the climate; and to coordinate the knowledge and experience of foresters, horticulturists and gardeners for their mutual benefit."

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WE NEED RESEARCH IN COLORADO

Here is something for everyone interested in the Horticulture of the West to think about

ON FRIDAY, March 7th, Dr. A. C. Hildreth, Superintendent of the Horticultural Field Station at Cheyenne, Wyoming, spoke to a joint meeting of the Men's Garden Club of Denver and the Denver Forester's Association at the City and County Building. He emphasized the importance of more horticultural research in our Rocky Mountain Plains areas. The facts he presented were rather startling. He said in part:

"The Central Great Plains and the adjacent Rocky Mountain area was the last great region of the United States to be settled. The eastern seaboard had already had 250 years to develop its horticulture before Denver was founded. But the horticultural discrepancy between our area and the Atlantic coast is greater than would seem from these figures. The eastern United States, in soil and climate, is not greatly different from western Europe, where there had been centuries of horticulture before America was discovered. Consequently, many European species and practices were adapted to conditions in our eastern states. However, our cold, dry winters, dry summers, strong winds, intense sunlight, and alkaline soils make up an environment quite different from that of the Midwest, or the East or western Europe.

"Consequently we could not borrow our horticulture from any other region but had to develop our own cultural practices and discover or develop our own horticultural materials. In view of our late start and of the absence of any great reservoir from which we could draw materials and practices adapted to our climate, this region needs more horticultural research than any other part of the United States, but exactly the reverse is true. The Central Great Plains and the Central Rocky Mountains of Colorado, Wyoming, and eastern Utah comprise an area of over 300,000

square miles. This is greater than the combined areas of the eight eastern states: New York, Pennsylvania, Ohio, the Virginias, New Jersey, Delaware and Maryland.

"Within our area there are six scientists doing full time research in horticulture and two additional doing full time work on potatoes which is sometimes classed as a horticultural crop. These are distributed as follows:

Cheyenne Horticultural Field Station.....	4
Colorado Agricultural Experiment Station	1
Nebraska Experiment Substation, North Platte	1
U. S. Department of Agriculture, Greeley, Colorado, research on potatoes.....	2

In addition, there are some scientists doing part time horticultural research in this area. These are distributed as follows:

Colorado Agricultural Experiment Station	5
Nebraska Agricultural Experiment Station	1

or the equivalent of less than three full time scientists, making a total equivalent of less than eleven full time horticultural research workers in this part of the country.

"In contrast the somewhat smaller eastern area referred to above, showed in the official directory of experimentation workers for 1945-1946 fifty-one full time employees in horticulture and 102 part time or a total equivalent of about a hundred full time workers, not counting the Federal research workers at Beltsville, Maryland, nor in any other of these states. This is about ten times as many horticultural workers per 100,000 square miles as we have. Thus, not only is our area handicapped by a late start and by our limited ability to borrow from other areas, but we are getting progressively further behind the eastern states because we are devoting so little effort to horticultural research."



Home of Harold Florman, Pueblo, Colo.

Photo by E. E. Warren

HORTICULTURE IN THE ARKANSAS VALLEY

IN SEPTEMBER 1946 the editor, and photographer, Edgar E. Warren, spent several days touring the Arkansas valley of Colorado from Canon City to Lamar. Trees, shrubs, vines, evergreens and flowers growing in each town and community were checked to determine those plants which grew readily there, and also to discover those which might grow if given a little encouragement.

This whole valley has been highly developed in its agricultural products, but has not gone nearly as far as it might in the horticultural line. The occasional person who had a "green thumb" and had taken the time to try new and different plants demonstrated that many more plants might be generally raised. The history of any community shows

that at first there is little attention given to permanent plantings, but most effort is given to the annual farm crops. As a community gains in age there is found more interest in trees, shrubs, vines, evergreens and those permanent plants that help to create pleasant permanent homes.

The plants now found growing in the valley tell the story of its advancing civilization. First there were planted a few native Cottonwood, Willow, Boxelder and American Elm. Then, a couple of decades ago there was a big boom in planting the "Chinese" Elm. In between, a few home-loving persons have planted many of the things with which they were familiar in their old homes.

A comparison of this valley with the



Home of Mrs. H. L. Garber, 3 Miles West of Rocky Ford, Colo.

Photo by E. E. War

populated areas of Colorado farther north shows that this section of the state has several horticultural advantages as well as some disadvantages. In general, the season is longer and milder here than in the Denver area. Over much of the valley there is a high degree of alkalinity of the soil which makes the raising of some plants difficult. A greater variety of plants is found in Pueblo than in any town for many miles east, partly because of its greater size and age. Almost any plant found growing in Pueblo might be raised anywhere in the irrigated part of the valley.

From Las Animas on east there seems to be a slightly milder climate, and many plants associated with Oklahoma and Texas are found surviving there. There also seems to be a decidedly less amount of alkali in the soil and water in the lower end of the valley.

The country immediately surrounding

Pueblo is rather barren, but going up the valley we suddenly come to an area of wonderful horticultural possibilities: the Florence-Canon City area. If it were not for the fact that this area is of small size it would be one of the most important communities in the state horticulturally.

The accompanying lists will give the plants of the area in two divisions, first, those which are generally found growing there now, and second, those which it has been demonstrated might be grown if a little extra care were given. It is always dangerous to make too many plantings of one kind of plant, such as has been done with the Siberian Elm. It gives ideal conditions for the attacks of insects and pests, and if some such catastrophe as the Elm diseases now plaguing the east should strike, a community would have to start planting all over again. It is safer and much more



Home of W. W. Johnson, La Junta, Colo.

Photo by E. E. Warren

attractive to plant a greater variety of things.

Exceptions to this general list will be noted in many of the outlying towns, but it applies to most of the irrigated portion of the valley. As we go beyond this irrigated area into the dry land a very different situation shows up. The lists of plants given for the Great Plains apply there. Water is definitely the most important factor.

PUEBLO

Horticultural conditions in Pueblo are unquestionably difficult, yet we found so many examples of good plants and plantings that it is evident that the city's appearance could be much improved if there were a little greater effort made to do so. Some of the public buildings were very well landscaped. We were especially attracted to the planting on

the grounds of the Y. W. C. A. Another downtown planting which was very appropriate was at the Community Chest Building at West Fifth and Grand. The Junior College had been carefully planned and planted. City Park and Mineral Palace Park were well arranged and contained many unusual trees and shrubs. Two rather attractive plantings especially caught the eye of the photographer: The home of Mr. and Mrs. Leonard Anderson at 704 West Orman Street and the home of Mr. and Mrs. Harold Florman, 425 Dittman. Some of the older estates here showed plantings of grand old trees, and many homes in the newer sections had well planned modern yards.

LOWER VALLEY

The dominating plant seen as we drove east from Pueblo was the Siberian



Home and Nursery of Leonard Sweetman, Las Animas, Colo.

Photo by E. E. Warren.

(Chinese) Elm. While this tree is classed as a weed where it is possible to raise better trees, we could not help but think how barren the valley would look if all these Elm were not there. Through Avondale, Fowler, Manzanola, Rocky Ford, Swink and La Junta the trees and shrubs cultivated were much the same and were rather limited in variety. In all directions from Rocky Ford the brilliantly colored patches of Zinnias being raised for seed were conspicuous. The general character of the farm homes were rather prosperous looking, and some had gone to considerable effort to beautify them on the outside. We noticed one farm yard which was very well landscaped and maintained. This was the home of Mrs. H. L. Garber, three miles west of Rocky Ford. She had made very good use of evergreens

and roses as a foundation planting.

At the little nursery in Swink we found many plants not previously seen in the valley. Some of these were Jet-bead, Vitex, Purple Plum, Wisteria, Mountain Ash and Pyracantha.

In the newer part of La Junta there were a number of well landscaped homes. Two striking places were the homes of Mr. and Mrs. W. W. Johnson and Mr. and Mrs. Middleton Stark south of town. Everyone in town said, "If you want to see flowers, go to Mrs. Goldie Jutkins' place north of town." We found Mrs. Jutkins one of those persons who possessed a deep green thumb. Her yard was full of unusual things as well as beautiful Dahlias, Gladioli, Lilies, Roses, Daylilies and all kinds of nice plants.

At Las Animas, Mr. Harold L.



Home of J. J. Caldwell, Las Animas, Colo.

Photo by E. E. Warren

Thurston spent the day in guiding us around the town and countryside. We were much surprised to run onto a beautiful large Bur Oak on the corner of Fourth and Bent Streets. The nursery of Mr. Leonard Sweetman was almost an Arboretum. Here were found growing happily many plants usually only found much farther south. Mr. Sweetman has demonstrated that the list of plants possible to grow in his town might be at least doubled. Here we found such things as Jasmine, tropical Yuccas, Pampas grass, Bamboo, Varnish tree, Arborvitae, Mimosa, Hoptree, Soapberry, Smoketree, Chinese Scholar-tree and Redbud. There were many nicely planted homes in the town. We were impressed with the appearance of the planting at the home of Mr. J. J. Caldwell, 819 Sixth Street.

LAMAR

Immediately on driving into Lamar we felt a nice homey, permanent atmosphere. The very appropriate planting in the parking in front of the Brown Lumber Company impresses every visitor to the town. Mrs. C. O. Eckles, Mr. John Y. Brown and Mrs. J. C. Knause spent the day showing us around the town. Everywhere we went there was evident the results of a great pride these people have in their community. Fairmont Cemetery and Willow Creek Park were remarkably well designed and planted. The planting of native Cottonwood trees on the sand dunes south of the park is an outstanding achievement in conservation and community beautification. We were much impressed with the landscaping of the public buildings



Sand Dune Planting South of Lamar, Colo.

Photo by E. E. Warren.

Home of Mr. Eaton, Lamar, Colo.

Photo by E. E. Warren.





Garden of Mrs. Perdue, 11 Miles North of Lamar, Colo.

Photo by E. E. Warren

and most of the private residences. It was difficult to select some of the most outstanding ones to photograph. The Clinic Building and residence of Dr. L. E. Likes was very attractive. The grounds of Mr. Ralph Eaton, 805 South Sixth Street were very attractively planted. We greatly enjoyed visiting the home of Mrs. L. S. Perdue, twelve miles north of town. Mrs. Perdue loves to work with her trees and flowers and she has developed a beautifully landscaped yard around her country home.

There must be less alkali in the soil and water in this community as the characteristic chlorotic condition of Spirea and Maple seen in the upper valley was missing here. All growing plants seemed more vigorous and many plants not seen on the rest of the trip were here growing well.

CANON CITY-FLORENCE

I do not believe that the residents in the Canon City-Florence area appreciate what their horticultural advantages are. As indicators of what the possibilities are there, we found a Persimmon tree, a Tulip tree, Norway Maples, a large Horse Chestnut tree and Hydrangea shrubs. All the ordinary trees such as American Elm, Ash, Soft Maples, Sycamores and Linden were growing unusually vigorously and appeared quite contented and happy. Apparently the growing conditions here are similar to those at Boulder, with the additional advantage of a longer season.

We could not find room in this issue to print all the pictures of beautiful spots in the Valley that we took. Several more will be used in a forthcoming article about industrial landscaping.

TREES, SHRUBS AND VINES FOR THE ARKANSAS VALLEY

Arranged more or less according to their present use or possible usefulness.

EVERGREENS

Rocky Mountain Juniper
Oneseed Juniper
Colorado Spruce
Ponderosa Pine
Pinyon Pine

Pfitzer Juniper
Savin Juniper
Tamarix Savin Juniper
Vonehron Savin Juniper
Eastern Redcedar
Silver Redcedar
Mountain Common Juniper
Black Hills Spruce
Scotch Pine
Austrian Pine
Mugho Pine
Douglas Fir
Chinese Arborvitae
Bristlecone Pine
Limber Pine

TREES

Western Broadleaf Cotton-
wood
Siberian (Chinese) Elm
American Elm
Honeylocust
Green Ash
Russianolive
Common Hackberry
Russian Mulberry
English Elm
Tree of Heaven Ailanthus
Silver Poplar
Sycamore
Black Walnut
American Linden
Bechtel Crabapple

Cork Elm
Golden Weeping Willow
Bur Oak
Western Catalpa
European Mountainash
Boxelder
Bolleana Poplar
Lombardy Poplar
Carolina Poplar
Silver Poplar
Soft Maple
Cutleaf Weeping Birch
Native Aspen
Kentucky Coffeetree
Norway Maple
Sugar Maple
Horsechestnut

TREES (Cont'd)

Cutleaf Weeping Maple
White Ash
Moline Elm
European White Birch
Black Cherry
Pin Oak
Red Oak
Dolga Crabapple
Hopa Crabapple
Redsilver Crabapple
Downy Hawthorn
Schwedler Maple

FRUIT

Siberian Apricot
Peach
Early Apples
Sour Cherry

Late Apples
Plums
Grapes

VINES

Native Clematis
Engleman Ivy
Silverlace Vine
Halls Honeysuckle Vine

Goldflame Honeysuckle
Boston Ivy
Wisteria
Trumpet Vine
Wintercreeper Euonymus
Clematis

SHRUBS

Common Lilac
Persian Lilac
European Privet
Amur Privet
Regel Privet
Vanhoutte Spirea
Korean Spirea
Snowberry
Coralberry
Golden Currant
Sumac
Shrub Roses
Siberian Peashrub
Tamarix
Bush Honeysuckle
Forsythia
Japanese Barberry
Mockorange
Cotoneaster
Snowball

SHRUBS (Cont'd)

Cranberrybush
Euonymus
Butterfly Bush
Shrub Althea
Wild Plum
Chokecherry
Hibiscus
Aromatic Sumac
Indigobush Amorpha
Dwarf Peashrub
Bush Cinquefoil

Late Lilac
Flowering Almond
Redleaf Barberry
Austrian Copper Rose
Prairie Rose
Winged Euonymus
Desmodium
Jethead
Redleaf Plum
Vitex
Lodense Privet
Garland Spirea
Frobel Spirea
Bluestem Willow
Chenault Coralberry
Pyracantha
Common Buckthorn
Glossy Buckthorn
Flowering Quince
Pussy Willow
Redbud
Native Hawthorn
Wayfaringtree
Elderberry
Mentor Barberry
Floribunda Roses
Beautybush
Japanese Tree Lilac
Aralia Spinosa
Hydrangea
Amur Maple
Mountain Alder
Mountain Birch
Nannyberry
Arrowwood
Buffaloberry
Lemoine Mockorange
Gray Dogwood
Manchu Cherry
Flowering Plum
Bush Rockspirea
Lilac Honeysuckle
Common Ninebark
Bladder Senna
Sandcherry
Smoke Tree

LIVING MEMORIALS AS LASTING TRIBUTES *

By HOMER K. DODGE

EVERY community will soon be faced with the question of creating a memorial to its World War II heroes. So let us look at what a memorial should be.

A memorial that is worth the name memorial must be a sincere expression of the ideals which caused it to be raised. The mere placing of a tablet or the naming of a place as a memorial does not give it the qualities of a memorial, even though giving it the name. It would be difficult to find a better expression of what the qualities of a memorial should be than that set forth by Paul Cret, one of America's leading designers and consulting architect for the American battle monuments commission of World War I. His expression is: "In a memorial the end to be achieved primarily, is the perpetuation of the memory of a great man or great event to future generations. This object being granted, it follows that permanency and a clear, arresting expression of the commemorative idea are essentials of the program and that the most appropriate memorial is that which may best withstand the changes of centuries, and by the beauty and dignity of its design arouse to attention and respect the heedless mind of the wayfarer and that of the wayfarer still to come." In this quotation, Mr. Cret has certainly pointed to the objective.

There are, of course, numerous methods of expressing this commemorative spirit. Many of these methods can fulfill this purpose if done well, and can almost destroy it if done poorly. Obviously a great deal of thought and discussion must go into the planning of a memorial or it will fail to express the deep feeling that we want to preserve or will fail to reach those succeeding generations which we wish to remind of

the events or of the men to whose memory we have created it.

Our experience of the past with memorials has shown us that piles of cannon balls, ancient artillery pieces, poorly designed statues and memorial tablets have failed to express the feeling we have for our war heroes. There has grown up lately, however, a strong sentiment for what has been called living memorials, such as parks, both city and state; arboretums, memorial avenues and recreation areas. This type of memorial seems to have possibilities of fulfilling all of the requirements of a really worthwhile memorial.

Since there is almost inevitably an expense connected with the building of a memorial, there has also been quite a clamor raised for making memorials useful. This suggestion has many merits, but we must pause and consider how far we can go with this idea without letting its usefulness overshadow its memorial purpose. If the idea of usefulness is carried to extremes, we might end up with a memorial garbage disposal plant, properly named and dedicated.

The living memorial, or what most of us think of as some form of park, has a considerable degree of usefulness, but is not so utilitarian that we would soon forget that it is a memorial. A park may very well have a building, a statue, or a tablet as a feature of its design which can have inscribed on it the purpose of the memorial. It certainly should make liberal use of the natural beauty of the grounds, of trees and other growing things. In order to stand as a permanent monument, it must be both appropriately located and well designed. In fact, too much stress cannot be placed upon the importance of securing the best possible advice on the selection of the site and the planning of its development, for if the idea is poor no amount

*From *American Nurseryman*, March 15, 1947.

of money spent in constructing it will make it pleasing enough to those who see it to make them want to preserve it, nor will its memorial spirit be felt.

Since permanence is an essential requirement of a memorial, let us look at the record of parks. There is probably no part of the world's older cities and towns that has withstood the changes of time better than parks, woods or retreats as they are variously called in different parts of the world. The individual trees and shrubs have died, but new ones have taken their places. Walks and pavings have disappeared, but people have worn paths in the earth. In Rome, woody retreats visited by the Caesars are still what we would call parks. The Mount of Olives is a park and was old when Christ visited there, yet even today it is essentially what it was 2,000 years ago. In our own much younger cities, the parks and squares laid out by the original settlers are still there, not entirely unlike their original design. Yet even what was supposed to have been the most permanent structure has long since disappeared.

A well planned living memorial obviously has the other requirements of a memorial. It is large enough to be impressive; it always has dignity. There is some beauty to all parks, and great beauty to those that are well cared for. The design can certainly express the reverence we feel. A park has an appeal for people of all ages and classes. There is practically no city or town whose community life would not be enriched by improving an existing park or creating a new one to form a living memorial to those who served in this war.

FOOD FOR DELPHINIUMS

- 1 part Wood Ashes
- 1 part Scotch Soot
- 2 parts Bonemeal

Apply one large trowelfull to each plant.

Note: Feeding roots of delphiniums are very close to surface, so make cultivation light.

Helen K. Fowler.

AN EASTENER LOOKS AT COLORADO

Upon reading the article, "Living Memorials," in the Green Thumb for March and April 1947, I thought at once of the auto camping trip my two boys and I took through your grand Western states this past summer.

I agree that beautification of the highway at many points would be nice, but also can imagine that just when trees are most needed, growth of same would be very difficult, as in Eastern Colorado. Moreover, as far as some Easterners like ourselves are concerned, we get quite a thrill out of the wide-open spaces and the road stretching ahead for miles without sign of tree or large bush.

I admit that an occasional shady grove of trees to picnic in would have been most welcome—and on this hinges the object of this letter.

Why couldn't the state through some of its agencies or departments construct a few well located picnic and camping sites along the main routes in Eastern Colorado? All that would be needed would be a few acres of land, preferably in a sheltered valley,—and water. If trees could be grown, of course they would be a splendid addition; but the main attraction would be water and a level spot in which to pitch a tent off the main road. I know that we would have gladly paid a dollar or two for the chance to use such a camp ground. Perhaps there are not enough auto campers these days to warrant the construction of camp grounds, and also Chambers of Commerce and owners of overnite cabins and motor courts might not be in favor of these competitors to business. However, it would seem to me that public camp grounds would make ideal memorials to the sons of Colorado who died in the defense of their country.

JOHN M. S. EMORY,
Westbury, Long Island, N. Y.

PERIODICALS WHICH MIGHT BE OF INTEREST TO OUR MEMBERS

BY MRS. E. R. KALMBACH AND GEORGE W. KELLY.

- AGRICULTURE IN THE AMERICAS**, From Supt. Documents, Gov't. Printing Office, Washington, D. C. 75c per year.
- AMERICAN FORESTS**, By the American Forestry Association, 919 17th St. N. W., Washington 6, D. C. Monthly, \$4.00 per year. Indispensable to those interested in Forestry in the United States.
- AMERICAN HOME**, 55 Fifth Ave., New York 3, N. Y. Monthly, \$1.50 per year. All-round home magazine, including a little gardening.
- ARNOLDIA**, By Arnold Arboretum, Jamaica Plain 30, Mass. \$1.00 per year. Monthly bulletin of interesting things in the Arnold Arboretum. Mainly applicable to the East, but many good suggestions.
- BETTER HOMES AND GARDENS**, Des Moines 3, Iowa. \$1.50 per year (3 years, \$3.00). Once popular gardening magazine. Now chiefly home making.
- PLANTS AND GARDENS**, Brooklyn Botanic Garden Record, Prince and Lemon Streets, Lancaster, Pa. Quarterly, \$2.00 per year. A leader in its field. Wonderfully edited and beautiful illustrations. Gardeners everywhere will enjoy it.
- CANADIAN NATURE**, 177 Jarvis St., Toronto, Ontario, Canada. 5 times a year. \$1.25. Very fine illustrations. Much of interest to our region.
- CORNELL PLANTATIONS**, Roberts Hall, Cornell Univ., Ithaca, N. Y. Quarterly. \$1.00. Another easterner. Peppy and full of information.
- FLOWER GROWER**, 99-129 No. Broadway, Albany, N. Y. Monthly. \$2.00. One of the best liked by garden club members and amateur gardeners.
- FRIENDS OF THE NATIVE LANDSCAPE**, 3749 N. Kildare Ave., Chicago 41, Ill. Quarterly. \$1.00 per year. Full of interesting facts and stories for those who would preserve our native landscape.
- GARDENER'S CHRONICLE**, 432 4th Ave., New York 16, N. Y. Monthly. \$2.50. The oldest in its field and still excellent.
- THE HOME GARDEN**, 444 Madison Ave., New York 22, N. Y. Monthly. \$3.00. A pocket-sized magazine written by leading garden experts of the East, who have not as yet discovered that there is such a thing as horticulture in the Rocky Mountain-Plains country. If you can weed out the information which does not apply to our country, you will enjoy the fine way that it is edited and illustrated.
- HOUSE BEAUTIFUL**, 572 Madison Ave., New York 22, N. Y. Monthly. \$4.00. High-class all-around home magazine, with heavy emphasis on gardening. Exceptionally well edited, and the one such magazine which checks all its garden articles for their application to varying climatic conditions over the United States. They indicate those plants and practices which apply to our region.
- HOUSE AND GARDEN**, Greenwich, Conn. \$4.00. Another large, Eastern highclass magazine which includes some good garden articles.
- HORTICULTURE**, Horticultural Hall, Boston 15, Mass. Bi-monthly, \$2.00. Articles brief but full of good information. An old favorite. Published jointly by the Mass., Penn. and New York Horticultural Societies.
- THE LAND**, Friends of the Land, 1368 N. High, Columbus 1, Ohio. \$5.00, quarterly. Thought-provoking articles related to the problem of conserving our valuable topsoil.
- LEAFLETS OF WESTERN BOTANY**, John Thomas Howell, Calif. Academy of Sciences, Golden Gate Park, San Francisco, Calif. \$1.00. Much of interest to botanists.
- THE LIVING WILDERNESS**, The Wilderness Society, 1840 Mintwood Place N. W., Washington 9, D. C. For those who are interested in preserving a few of the unspoiled spots of natural wilderness for posterity.
- MISSOURI BOTANICAL GARDEN BULLETIN**, 2315 Tower Grove Ave., St. Louis 10, Mo. Monthly, \$2.50. Interesting reports from the Arboretum.
- MORTON ARBORETUM BULLETIN**, Lisle, Ill. Monthly. \$1.00. A "Bulletin of Popular Information." Very valuable information, written by authorities in an interesting way and illustrated by some of the finest drawings in horticultural literature. Close enough to us that much of the information applies.
- NATIONAL GEOGRAPHIC MAGAZINE**, 16th and M Sts. N. W., Washington 6, D. C. \$4.00. Nothing like it for armchair globetrotting. Unsurpassed illustrations. In a class by itself.

NATIONAL HORTICULTURAL MAGAZINE, By American Horticultural Society, 821 Washington Loan and Trust Bldg., Washington, D. C. Always attractive and authoritative. Some material over the heads of all but professional botanists. They welcome contributions, from our region, or any part of the U. S.

NATURE MAGAZINE, 1214 Sixteenth St. N. W., Washington, D. C. \$2.50. Its title tells the story. Much of interest to child or adult.

NEW YORK BOTANICAL GARDEN JOURNAL, Bronx Park, New York 58, N. Y. \$1.50 per year. Indispensable for knowledge of plants.

ORGANIC GARDENING, Read Magazine, Inc., \$2.00, Monthly. Sixth and Minor Sts., Emmaus, Pa. Advocating the advantages to be gained by using organic fertilizers. Many good ideas and some controversial.

WILDFLOWER, 3740 Oliver St. N. W. Washington 15, D. C. \$1.50. The organ of the Wildflower Preservation Society.

If any of our readers know of other publications which might be of interest to our readers we would appreciate their name, address, price and purpose.

WINTER DAMAGE TO LOW JUNIPERS

A great deal of damage was done to low junipers last winter. Many have a substantial number of dead twigs and branches, while plants that were set out last fall are often found wholly dead. Lack of any evidence of insect damage, or of disease, or of mistreatment in these plants would indicate that the unusual snows of last November and this spring were responsible for these losses. Some of the damage to established plants was breakage from the weight of snow, but the fall planted evergreens which died were evidently smothered by snow in the November blizzard. Do not blame your nurseryman entirely for these "Acts of God."

G. W. K.

Pictures on next two pages are of Pyramid Peak. Photo from D. & R. G. W. R. R.

DID YOU KNOW?

That we have our OWN HOME at 1355 Bannock Street, the formal opening of which will come soon?

That we have a FULL TIME HORTICULTURIST—George W. Kelly—whose job it is to help you in your horticultural problems?

That we publish for you this fine magazine, THE GREEN THUMB, telling you *what* to grow in Colorado, and *how* to grow it?

That we maintain, for you, at Horticulture House, an extensive HORTICULTURAL LIBRARY?

That throughout the year, we shall provide for you, a series of INSTITUTES on Horticulture?

That we are continually working for the preservation of the State's natural BEAUTY SPOTS, and encouraging the establishment of State Parks, Highway Parks, Botanical Preserves and similar planting all over the State?

That these are but a *small fraction* of

the privileges and benefits you will receive as an incident to your membership in the Association?

That all we are doing for you costs quite a *large* sum of money each year?

That if each present member would try to interest a friend in becoming a member, we would double our membership and be able to improve and increase all these services?

That if a number of our Annual Members would send in \$4.00 now they would be immediately changed to Sustaining Members, (dues \$5.00 thereafter) and we could be *moderately* certain of our continued existence?

That if a number of Sustaining Members would send us \$5.00 now they would be immediately changed to Patron Members, (dues \$10.00 thereafter) and we could be *absolutely* certain of our continued existence?

That we will go forward only as we have the support of all our members?

MEMBERSHIP COMMITTEE





WE NEED WILDERNESS

BY SIGURD OLSON

Condensed by permission from the January-March 1946 issue of National Parks Magazine

ACCORDING to Webster, wilderness is a trackless waste uninhabited by man. To the people of America it is far more than that. It is something so closely tied up with their traditions, so tightly woven into their cultural backgrounds, their emotions and philosophies of life, that it cannot be ignored or neglected.

Wilderness to the people of America is a spiritual necessity, an antidote to the high pressure of modern life, a means of regaining serenity and equilibrium.

I have found that people go to the wilderness for many things, but the most important of these is perspective. They may think they go for the fishing or the scenery or companionship, but in reality it is something far deeper. They go to the wilderness for the good of their souls. I sometimes feel as though they had actually gone to another planet from which they can watch with cool detachment the fierce and sometimes meaningless scurrying of their kind. Then when the old philosophy of earthoneness begins to return to them, they slowly realize that once again they are in tune with sun and stars and all natural things, and with that knowledge comes happiness and contentment.

I believe this need of wilderness is inherent in most of us, even those seemingly farthest removed from it by civilized living. The cities may cover it up, make us forget temporarily; but deep underneath is an inherent urge for naturalness and simplicity and a way of life different from the one we know.

There is a school of thought that considers wilderness solely as an opportunity for nature study and scientific research and sees no spiritual value in the effect of wild country on those who come in contact with it. These people lack vision, for if they understood the primary purpose of the accumulation of knowledge generally, they would know that unless such effort results in further-

ing man's sense of companionship and understanding of the earth, and thereby contributes to his spiritual contentment and happiness, it has not achieved its purpose.

There is another group made up of practical minded individuals who see no sense in setting aside an area for esthetic or recreational purposes. This group considers wilderness devotees as irresponsible wildlifers who have gone off the deep end in their enthusiasm for the out-of-doors. They look at the last remaining bits of primitive America as a final opportunity to "get rich quick" in the best pioneer tradition. They are the ones who would dam Yellowstone Lake, cut the last sequoias, and convert the canoe country of the Quetico-Superior into a huge storage reservoir. To them the wilderness has no other value than the practical, and they think it criminal for resources to stand commercially unused. They also need the wilderness, but their need is blinded by greed.

There is a third group larger than all the rest. That is the great mass of recreation-minded Americans who see in the wilderness not an opportunity for exploitation or for furtherance of knowledge, but rather as an opportunity to satisfy a vital spiritual deficiency within themselves. They are the ones who head into the wilderness regions because they must. Wilderness to them is a tonic, a panacea for nervousness and monotony. They go to it once a month or once a year as a sick man might go to his physician. These people know that wilderness to them is a necessity if they are to keep their balance.

To place a value on wilderness is as difficult as to speak of the value of a landmark or an heirloom in terms of money. There are certain things that cannot be evaluated because of their emotional appeal. Wilderness is in this category. While a certain area might

have worth as a museum piece, or because of certain economic factors, its real worth will always depend upon how people feel about it and what it does for them. If it contributes to spiritual welfare, if it gives them perspective and a sense of oneness with mountains, forests or waters, or in any way at all enriches their lives, then the area is beyond price.

Some can find their wilderness in tiny hidden corners where, through accident rather than design, man has saved just a breath of the primeval America. I know of a glen in the heart of a great city park system, a tiny roaring canyon where many seeking solitude and beauty can find release.

There are men, however, who crave action and distance and far horizons beyond the steel. No little sanctuaries for them along the fringes of civilization. They must know wild country and all that goes with it, must feel the bite of a tumline on the portages, the desperate battling against waves on stormy lakes. They must know hunger and thirst and privation and the companionship men know only on the out trails of the world. When, after days of paddling and packing, they find themselves on some bare glaciated point a hundred miles from town, and stand there gazing down a great wilderness waterway, listening to the loons and seeing the wild rocky islands floating in the sunset, they, too, know the meaning of communion with nature.

Another finds his wilderness in the mountains of the west. There, camped in some high alpine meadow, with the horses grazing quietly along an ice-fed glacial stream, jagged peaks towering above him into the snow-capped summits of some mighty range, and all about him the beauty and grandeur of the high country, he finds his particular ultimate. To him such a setting is the primitive on a noble scale—there is timelessness that can never be approached elsewhere. The very bigness of the landscape gives him a sense of personal contact with

immensity and space. He comes down from his mountains, as all men have since the beginning of time, refreshed spiritually and ready again for the complexities of life among his kind.

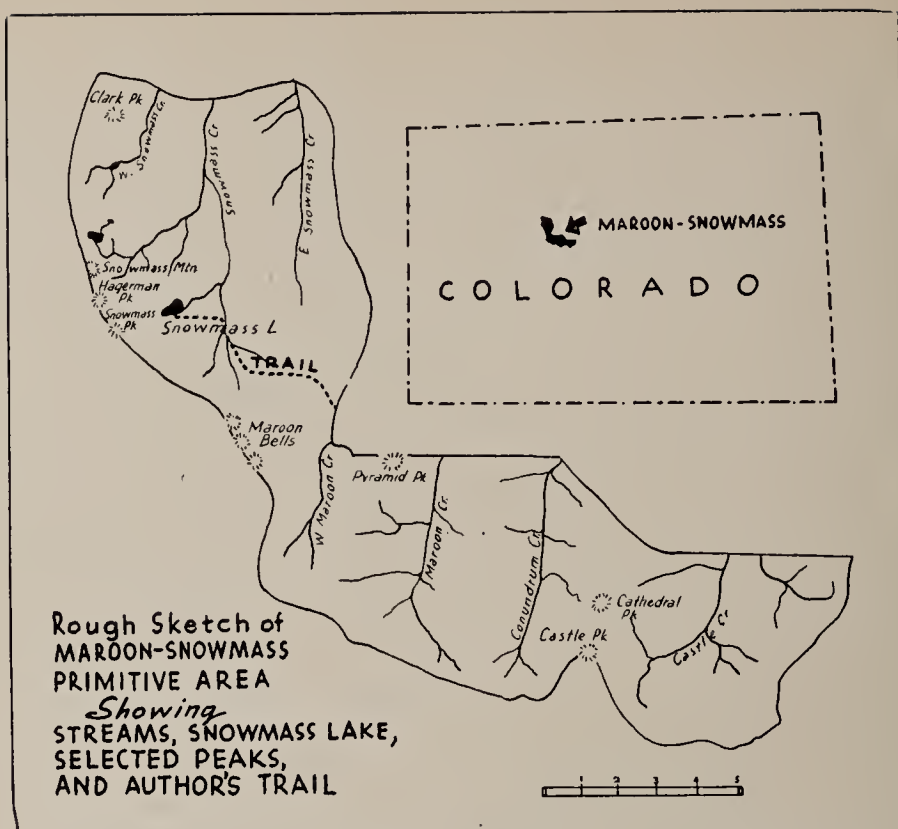
There are those who say that only in the great swamps and flowages of the deep South, in the flooded cypress stands and mangroves, or along the deltas and savannas of the rivers, can one understand what wilderness really is. And in a sense they are right, for it was in such places that life supposedly evolved.

Whatever their type and wherever they are found, be these wilderness places large or small, mountains, lakes, deserts, swamps or forests, they do fill a vital need. Gradually wilderness has become a cultural necessity to us, the people of America, and while it does play an important recreational role, its real function will always be as a spiritual backlog in the high speed mechanical world in which we live. We have discovered that the presence of wilderness in itself is a balance wheel and an aid to equilibrium.

City life is artificial. Because artificiality leads to a sense of unreality and frustration, unhappiness often results. That is the price a people pays for high technological success, and that is the reason an intelligent, thinking people knows that unless it can break away and renew its contact with a slow-moving natural philosophy, it will lose its perspective and forget simplicity and wholeness.

We know now just how valuable these fragments of the old America have become to us as a people. We see them now in a new light and realize that in addition to being museum pieces, they are vital to our happiness, and they are investments in national character.

To give the people of this country an opportunity to renew their old associations as a race, to find themselves and their real qualities, to rejuvenate their spirits through simple living in the out-of-doors, is the real purpose of the preservation of wilderness.



Drawing from Bernard Frank's Article in The Living Wilderness.

NATIONAL FOREST WILDERNESS AREAS

BY L. C. SHOEMAKER

The following article is the first of several in which we plan to tell you something about the more remote areas of the State, which the U. S. Forest Service has set up for special purposes under the general name of "Wilderness Areas." These areas are not as well known as our widely advertised National Parks, but comparable to them in natural beauty and charm, and more adapted to the use and enjoyment of us who like Nature in as nearly a natural state as it can be found.

In this article, Len Shoemaker, our efficient treasurer and administrative trouble-shooter, leads off with a brief resumé of National Forest establishment, a list of the designated areas, and a brief description of the Maroon-Snowmass Primitive Area, where he worked for almost 20 years as a U. S. forest ranger.

Other descriptions will follow as space is available.

GEORGE KELLY, EDITOR

NATIONAL FORESTS

IN THE United States there are 152 National Forests with a net total of about 179½ million acres of federally owned land. Twelve of these Forests are in Colorado, namely: Arapaho, Grand Mesa, Gunnison, Montezuma, Pike, Rio Grande, Roosevelt, Routt, San Isabel, San Juan, Uncompahgre, and White River. They comprise 13,697,257 acres.

Under the Act of March 3, 1891, which empowered Presidents to establish timber land reservations, in order that

the Nation might possess, protect, and perpetuate their many resources for the good of its citizens for all time, the National Forests were at first withdrawn from the public domain in western states. Subsequently the name was changed to forest reserves and in 1907 to national forests.

Later, the government secured title to other suitable forested lands by purchase and exchange, and Forests were established in eastern states.

A Congressional Act of June 4, 1897 gave the General Land Office the author-



*View Toward the East Into the Valley of the North Fork of Crystal River.
The Maroon Mountains in Left Central Background.*

Photo by
U. S. F. S.



West Maroon Canon. Trail Riders Climbing Toward Buckskin Pass.

Photo by Jay Higgins
U. S. F. S.

ity to man and administer the then forest reserves, and a Forest Reserve Service was organized. Its principal function was to protect the timber on the reserves from fire and trespass.

Col. W. T. S. May, a Denver attorney, was appointed forestry superintendent for Colorado and Utah, and opened an office at No. 8, Union Block, on Sixteenth street, on August 8, 1898. On that day he appointed William R. Kreutzer (now a resident of Fort Collins) as his first forest ranger and Wm. H. Standart as his first forest supervisor.

In 1905, President Theodore Roosevelt directed the reorganization of all forestry units, and the present U. S. Forest Service was formed. On February 1, it assumed control of these federally owned lands and resources, and, consistent with the broad purpose for which they were established, has successfully managed them under a system which has permitted use without depletion. This involved a rather complex plan of multiple use, which, in the main, has proved satisfactory.

In 1875, The American Forestry Association of Washington, D. C., was organized in Chicago, for the avowed purpose of advancing the cause of forestry, and, consistently, throughout the years it has been a leader in forestry policies and practices. In 1884, The Colorado State Forestry Association (our original organization) was formed for the same purpose, and through the influence exerted by some of its leaders our state constitution contains a brief but important measure relative to the subject.

WILDERNESS AREAS

In line with its many-use program the U. S. Forest Service has set up a number of the more remote and undeveloped regions under designations which conform generally to the accepted term, "wilderness." This was done in order to preserve in their primitive state representative mountainous and forested parts of the National Forests for future generations to see and enjoy.

The grazing of domestic stock, development of water-storage projects, and improvements necessary for fire protection may be permitted, but no commercial enterprises or timber cutting and no roads will be allowed.

These areas in Colorado are:

1. Big Creek Lakes Scenic.....Routt N F
2. Mt. Zirkel-Dome Peak Wild....Routt N F
3. Bears Ears Scenic.....Routt N F
4. Rabbit Ears Scenic.....Routt N F
5. Fish Creek Falls Scenic.....Routt N F
6. Walton Falls Scenic.....Routt N F
7. Flat Tops Primitive.....White River N F
8. Gore Range-Eagle Nest Primitive.....
.....White River and Arapaho N F
9. Maroon-Snowmass Primitive
.....White River N F
10. Gothic NaturalGunnison N F
11. West Elk Primitive.....Gunnison N F
12. National Elks Scenic...Uncompahgre N F
13. Uncompahgre Primitive
.....Uncompahgre N F
14. San Juan Primitive.....San Juan N F
15. Mount Wilson Wild.....Montezuma N F
16. Narraguinnep Natural.....Montezuma N F
17. Upper Rio Grande Wild..Rio Grande N F
18. La Garita Wild.....Rio Grande N F
19. Hurricane Canyon Natural.....Pike N F
20. Craggs Scenic.....Pike N F
21. Bison Wild.....Pike N F
22. Mt Goliath Natural.....Arapaho N F
23. Rawah Primitive.....Roosevelt N F

THE MAROON-SNOWMASS AREA

The Maroon - Snowmass Primitive Area lies along the north side of the Elk Mountain Range in Pitkin county and the White River National Forest. Its natural state is still well preserved despite the inroads of a horde of prospectors and miners who scoured the area for gold and silver in the 80's, and the subsequent use of its resources by ranchers who settled the adjacent valleys.

The Elk Mountains form one of the most interesting areas in the State. Mr. F. V. Hayden, U. S. geologist, who surveyed the area in 1873-4, described it as the most complex geological formation to be found anywhere. In the early disturbance of the earth's surface, parts of it shot into the air and fell backwards, thus turning the stratas upside down.

The area is a mecca for mountain

Maroon Peaks.

Photo by D. & R. G. W. R. R.





climbers, for six of Colorado's 14,000-ft. peaks and a score almost as high are there. The 14's are: Castle, North Maroon, South Maroon, Pyramid, Snowmass, and Capitol. Some of the 13's are Cathedral, Daly, Keefe, Hunter, Ritchie, and Travelers. The most widely known is Hagerman.

Many beautiful lakes afford fair to excellent fishing. Exceptionally good campsites are available at each, easily accessible by trail. Snowmass, the better known and more highly used of the group, has been improved to take care of the large number of visitors. Other lakes are: Cathedral, American, Willow, Maroon, Crater, Geneva, Pierre, Capitol, and Avalanche.

The Colorado Mountain Club of Denver has pitched outing camps at Snowmass Lake and elsewhere in the region several times. The American Forestry Association of Washington, D. C., has conducted several Trail Riders of the Wilderness expeditions through it. Members of these groups and thousands of other visitors testify enthusiastically to its wonderful recreational possibilities.

During the writer's tenancy of the Aspen district of the once Sopris, then Holy Cross, now White River National Forest, a good trail system was developed. Two of these trails are now widely known: the Panorama, from Ashcroft to Conundrum Hot Springs; and the Maroon-Snowmass, from Maroon and Crater lakes to Snowmass lake. The former crosses Electric Pass at 13,400 feet, and the latter crosses Buckskin Pass at 11,500 feet. Both afford outstanding views of the beautiful area they cross.

Good forest development roads lead to the area from Aspen, the now famous ski resort. One ends at the Lindvig ranch on Snowmass creek, one near Ashcroft on Castle creek, and the other at Maroon lake. The last named is sometimes referred to as Shoemaker's Folly, because some thought he was foolish to fight so long and persistently for its construction. But visitors to the area soon learn why. Beyond the end of that road

lies Paradise now—as old Omar would say it—for all lovers of the wilderness.

The beauty of the Maroon-Snowmass area is largely due to its geologic construction, but it would probably not be known as the most beautiful spot in the State if it were not for its botanical attractions. In the summer the columbines are in their glory, many slopes being covered with them. Here they seem to be at their best in size, richness of color and number. In the alpine and subalpine meadows there are masses of brilliantly colored paintbrush, asters, gentians and potentillas. Along the icy streams are knee-deep masses of pink and blue mer-tensia and white cardamine with occasional clumps of the brilliant Parry's primrose, Kings crown and little pink elephants.

Lodgepole pine, Engelmann spruce and Alpine fir are the predominating trees with Douglas fir found occasionally on the lower northern slopes and Limber pine occasionally at higher altitudes. Along the streams everywhere are willows and in favorable locations many mountainash with their orange-red fruits in season. Chokecherry, mountain maple and serviceberry are numerous. The red-berried elder with its brilliant fruit, the shrubby cinquefoil with its small yellow flowers and the bearberry honeysuckle with its twin black berries in their purple involucre decorate the slopes. The mountain balm with its thick fragrant leaves, raspberries, gooseberries, currants and strawberries are found in many suitable locations.

And everywhere, intermingled with the other plant life, are the aspens with their twinkling leaves which turn to red and gold as autumn approaches. These with the other trees, flowers and shrubs add the finishing, softening touch to this land of rugged mountains and brilliant colors.

Maroon Peaks and Crater Lake.

Photo by Jay Higgins of U. S. F. S.





EVERGREENS—THEIR SELECTION AND CARE

BY ROBERT E. MORE

4. Tall Evergreens*

THE TREES of this group are from 20 to 35 feet in height and they are, perhaps, more interesting than any others. Numerically, the number of splendid varieties available far outnumber those in any other group. The uses of these trees are varied: Foundation plantings, screens, accent, transition, groups, boundaries—and other uses that will be discussed later.

Most important in this group of "tall trees" are the erect Junipers, often popularly called "Cedars." Actually, none of the true Cedars are hardy in Colorado, but *Juniperus virginiana* has been called "Eastern Redcedar" so long that this popular name has not only become current in all parts of the country, but has been officially adopted by Standardized Plant Name, (S.P.N.). Our own *Juniperus scopulorum* is called "Rocky Mountain Cedar" almost as frequently as it is "Rocky Mountain Juniper"—the name selected by S.P.N.

Four species of Juniper furnish the great majority of the trees in this group: *Juniperus chinensis* or Chinese Juniper, *Juniperus virginiana* or Eastern Redcedar, *Juniperus scopulorum* or Rocky Mountain Juniper, and *Juniperus monosperma* or Oneseed Juniper. Three of these four species are very variable when grown from seed, and many of the outstanding seed variations in color and form have been preserved through grafting. By cutting off a tip of the preceding year's growth and grafting it upon a seedling stock, any Juniper can be exactly reproduced. This makes it possible to perpetuate hardy and beautiful strains and these grafts or clons furnish most of the more choice Junipers now offered by the modern nursery.

Grafting has two additional advantages: Junipers, unlike most plants, usually have the male and female organs on separate trees. The male, or staminate tree, bears pollen; the pistillate, or female tree, has berries. To many people, the blue berries of the Juniper constitute one of its greatest attractions. A graft from a berry tree itself has berries. Thus grafting makes it possible to be certain of berry trees. And finally, since most grafts of a given variety are practically identical in form and color, perfect matching of pairs—or larger multiples—is thus made possible.



Moffet Juniper

*Previous articles in this series appeared in the January, May and September, 1946, number of *The Green Thumb*.

All of the Junipers that we shall describe are completely hardy in Denver. They all have two severe insect enemies, however—red spiders and aphids. These pests can be easily controlled by regular spraying or dusting, and the beauty of these trees more than justifies this small annual expense. Unfortunately, many people have been led to believe that washing a Juniper with the garden hose will control red spiders. In Colorado, at least, it will *not*, in any save the mildest infestations. Because of this misconception many beautiful trees in Denver have been practically ruined. Use your garden hose, but have a Hays Junior Sprayer on the end of it, with a proper solution in it. Better still, employ a professional, who sprays with 400 lbs. of pressure. A spraying or dusting with lime-sulphur in April *before* any growth has started, followed by a nicotine-soap spray or a nicotine dust in mid-June and July will keep 99% of your Junipers in the condition of the trees shown in the illustrations. Failure to do this will result in the type of Juniper often seen in our public parks.

About the only disease to attack Junipers in Colorado is the Cedar Apple Rust, a fungus requiring two different host plants, the Juniper (Cedar) and a member of the apple family (including Hawthorns.) The pest can always be controlled therefore, by removing all members of the apple family in the vicinity. Kumlien's "The Friendly Evergreens" (which should be in every horticultural library) says that spraying with colloidal sulphur at the rate of 3 lbs. to 50 gallons of water every 10 days in July and August often helps.

The Cedar Apple forms a brown gall which affixes itself to the larger branches and is very disfiguring. (See illustra-



The Cedar Apple

tion.) Both the *virginiana* and *scopulorum* species are susceptible to it. The *chinensis* species seems to be immune, however, as does the *monosperma*.

Since a member of the *chinensis* species constitutes the writer's favorite Juniper, it will be first discussed.

KETELEER CHINESE JUNIPER (*Juniperus chinensis keteleeri*).^{*} This is a pistillate tree with the largest berries of any Juniper in common cultivation. It keeps its rich green color splendidly in winter, preserves its central leader well (thus making it less susceptible to snow injury) and forms a handsome, broad pyramid which requires very little trimming.

Other tall *chinensis* varieties are offered by eastern nurseries, but few have proved entirely satisfactory in Colorado. They all (with the exception of the Keteleer) tend to hold their dead foliage so as to give the tree an untidy appearance. We shall, therefore, not describe other members of this species, but pro-

^{*}The authorities are in dispute as to whether the Keteleer is *virginiana* or *chinensis*. Since it is immune to the Cedar Apple Rust many nurserymen claim it is *chinensis*.

ceed to the *virginiana* group, which furnishes some of the most beautiful evergreens that grow.

CANAERT EASTERN REDCEDAR (*Juniperus virginiana canaerti*). Even the beautiful colored illustration, generously made available to us by the D. Hill Nursery Company, (See inside of front cover) does not flatter this magnificent tree. It has the darkest and richest green foliage of almost any evergreen and is frequently loaded with

Glenmore Queen, Rocky Mountain Juniper.



tiny, light blue berries that contrast vividly with its unusual foliage. Like all members of the *virginiana* species, its branches grow more horizontally than do those of the *scopulorum* group, and if the tips of the Canaert are not regularly clipped, the tree will get a little sprawly. Don't shear it into a formal cone, however. By so doing, the essential character of the tree is lost—and its annual berry crop, besides. The pruning done on the tree in the colored illustration is perfect. Another nice Canaert is illustrated in the May, 1946, issue of *The Green Thumb*.

One final caution may prevent disappointment as to the small Canaert brought you by your nurseryman: This tree is usually a little thin of foliage until it reaches six feet in height. Staking and regular shearing are both necessary for the proper development of the small Canaert.

HILL DUNDEE EASTERN REDCEDAR (*Juniperus virginiana hillii*). This tree, first offered by the D. Hill Nursery, is another of the most outstanding trees ever developed. More slender and compact than most *virginiana* trees, it is ideal at the corner of a building. Its foliage is rather heavy, as is common with the *virginiana* species, and of a nice grayish green color during the summer. During the winter, however, it becomes a spectacular purple plum, contrasting vividly with all other evergreens.

Space does not permit a detailed review of the other fine *virginiana* trees. Each of the following is outstanding:

HILLSPIRE or CYPRESS EASTERN REDCEDAR (*Juniperus virginiana cupressifolio*). This has heavy dark green whipcord foliage and a fine berry crop.

SILVER EASTERN REDCEDAR (*Juniperus virginiana glauca*). This tree is silvery blue in color and has berries; it is one of the oldest horticultural varieties. Give it careful shearing and

staking for its best development, as it inclines to an irregular growth.

BURK EASTERN REDCEDAR (*Juniperus virginiana burki*). This is a newer form with steel blue foliage; it has better form and more dense foliage than the Silver Redcedar.

None of the *virginiana* species do as well in the higher elevations as do the *scopulorum* species. Do not use *Juniperus virginiana* trees for landscaping the mountain home, therefore. As was previously stated, they are completely hardy in Denver and similar locations. They have proved hardy in Boulder, also.

Even more variable than the *virginiana* species is our own *Juniperus scopulorum*, the Rocky Mountain Juniper. The clons are almost as numerous as the propagators, each feeling, with justifiable pride, that his own creation is better than any other. We have endeavored, therefore, to get a consensus as to the six or seven best "Scop" clons, and shall give a brief discussion of each of these universally acclaimed trees. As with the other groups, the writer will describe these trees in the order of his own preferences.

GRAY GLEAM ROCKY MOUNTAIN JUNIPER. (*Juniperus Scopulorum gray gleam*). This tree is almost a true silver shade. Most Junipers assume a drab, dull winter color. Gray Gleam, however, becomes even more brilliant during the winter months. Slow of growth, it stays in scale long, and its vertical branches with thick, whipcord foliage form a natural pyramid, which requires almost no shearing. Like the famous **PATHFINDER**, however, it is a staminate or male graft and thus never has berries.

SILVER BEAUTY. This variety is a lovely, slender berry tree, introduced by Lloyd Moffet of the Plumfield Nurseries, Fremont, Nebraska, and conservatively described by him as follows:

"A native of the San Isabel Forest region (Colorado), and truly a beautiful tree. It is upright, full at base, branches have

upward trend, foliage is greenish-silver, more silver on the exposed tips of branches. Grows about one foot a year."

HILL SILVER. This famous offering of the D. Hill Nursery of Dundee, Illinois, is pictured in color herewith (Again we thank the D. Hill Nursery for lending these beautiful color plates to *The Green Thumb*). Mr. Kumlien says of this tree in *The Friendly Evergreens*,

"It is of unusual, bluish color and of an attractive, compact growth, probably never reaching more than twenty feet but it can be trimmed and maintained at a smaller size."

SUTHERLAND. This tree was developed by the Sutherland Nursery of Boulder, Colorado, and is a universal

Colorado Pinyon Pine.





Swiss Mountain Pine.

Photo by O. Roa

western favorite. Refer back to the splendid picture of this graft which was used to illustrate Mr. Scott Wilmore's article on *Juniperus scopulorum* in *The Green Thumb* for May, 1945. The Sutherland is pistillate, but has smaller berries than most "Scops." Its dark, moss-green color remains remarkably constant throughout the year. Its ascending branches need little trimming.

MOFFET. Mr. Frank Richard of Fort Collins has made available to us the picture on page 28 of this tree. He has aptly described this graft as follows:

"Remarkably symmetrical habit; branches grow close together making a very dense tree with a minimum of shearing. Dominant color is light greenish silver but in season

the new growing tips are heavily silvered, giving the appearance of light hoarfrost. Heavy annual crops of berries add much to winter interest."

EMERALD. This handsome green clone of the Marshall Nurseries (Denver and Nebraska) furnished a needed variation from the blue and silver trees usually offered by the trade. The Emerald is a compact and tidy berry tree.

PATHFINDER. This is possibly the best known *Scopulorum* clone. It too was originated by Lloyd Moffet, and it is, perhaps, the bluest blue of all—at least in the younger trees. The writer has had to give more attention to the maintaining of a leader on this tree than with the grafts previously mentioned, and for



Pyramidal Arbor Vitae.

Photo by O. Roach.

that reason alone does not rank this tree as highly as the preceding.

The following clons of *J. scopulorum* are also all exceptionally fine trees; STOVE PIPE, forming a slender column; MARSHALL, a silver berry tree; MADORRA, spectacular, with two types of foliage commingled; GLENMORE QUEEN, a rounded, blue pyramid carrying a heavy crop of berries, the parent tree of which is illustrated on page 30; DEWDROP, a very fat, multiple stemmed tree with very heavy foliage—and susceptible to snow injury.

The proper shearing practices for the erect Junipers were described in the May, 1946 issue. Their adaption to hedge use has likewise been developed (*The Green*

Thumb, January, 1946). They lend themselves to foundation planting, contrast and accent groups (cover of *The Green Thumb*, May, 1946)—both formal and informal—and they are frequently used for delineating the corners of formal garden units. The allée of Junipers at the entrance to Crown Hill Cemetery is of breath-taking beauty. These superb specimens, thirty feet high and ten feet in diameter, give warning that they can get out of scale at the small home in twenty years. Because of its ultimate size an erect Juniper should always be planted at least four feet from the house.

While *Juniperus scopulorum* is sometimes afflicted with blight in the moister eastern climates, this is almost never

found in the dry western states. Like its eastern cousin *J. virginiana*, the "Scop" is susceptible to Cedar Apple Rust, if diseased members of the apple family are near by. But the only substantial problems are red spiders and aphids, and regular spraying or dusting will always control these pests, and thus make available to us another outstanding species for Colorado landscaping.

Before leaving the Junipers, reference should be made to our Colorado native, the ONESEED JUNIPER (*Juniperus monosperma*.) This hardy citizen of the southwest comes as far north as Colorado Springs, and is being used more and more for group plantings, boundaries and hedges. (See page 4 of *The Green Thumb* for May, 1946). Being slower growing than the Rocky Mountain Juniper, and bushier in growth habit, it is excellent for an informal hedge, as well as a formal one. It seems to be without insect enemies. Thus far, no grafted stock (making uniform color and form possible) has been developed. It would seem this offers an attractive field for the nurseryman.

COLORADO PINYON PINE. (*Pinus cembroides edulis*). Although the Pinyon will exceed 20 to 35 feet in its native state, it is so slow growing—particularly if the "candles" are docked now and then, as described in the May, 1946 issue—that it may be employed horticulturally in much the same fashion that the Rocky Mountain Juniper is. Usually the Colorado Pinyon is squat and irregular, when growing naturally. The nurseries select slender, single stemmed specimens, however, which form nice pyramids on the home grounds. (See illustration.) The Pinyon is being used more and more in boundary plantings on large properties.

SWISS MOUNTAIN PINE (*Pinus mugo*). This tree, like its dwarf cousin *Pinus mugo mughus*, naturally forms a bush with several stems. (The dwarf variety will be discussed in a later issue.) Nice specimens are to be seen in

the 17th and 7th Avenue Parkways, and on the south drive to the Colorado Museum of Natural History in City Park. Groups, boundaries and backgrounds constitute the most frequent use of this pine. A mature tree in cultivation will reach a height of 20 feet and a diameter of 12 or 15 feet. Mr. Roach's photograph is of a tree on the 7th Avenue Parkway. The Swiss Mountain Pine does not stand up well under heavy snow.

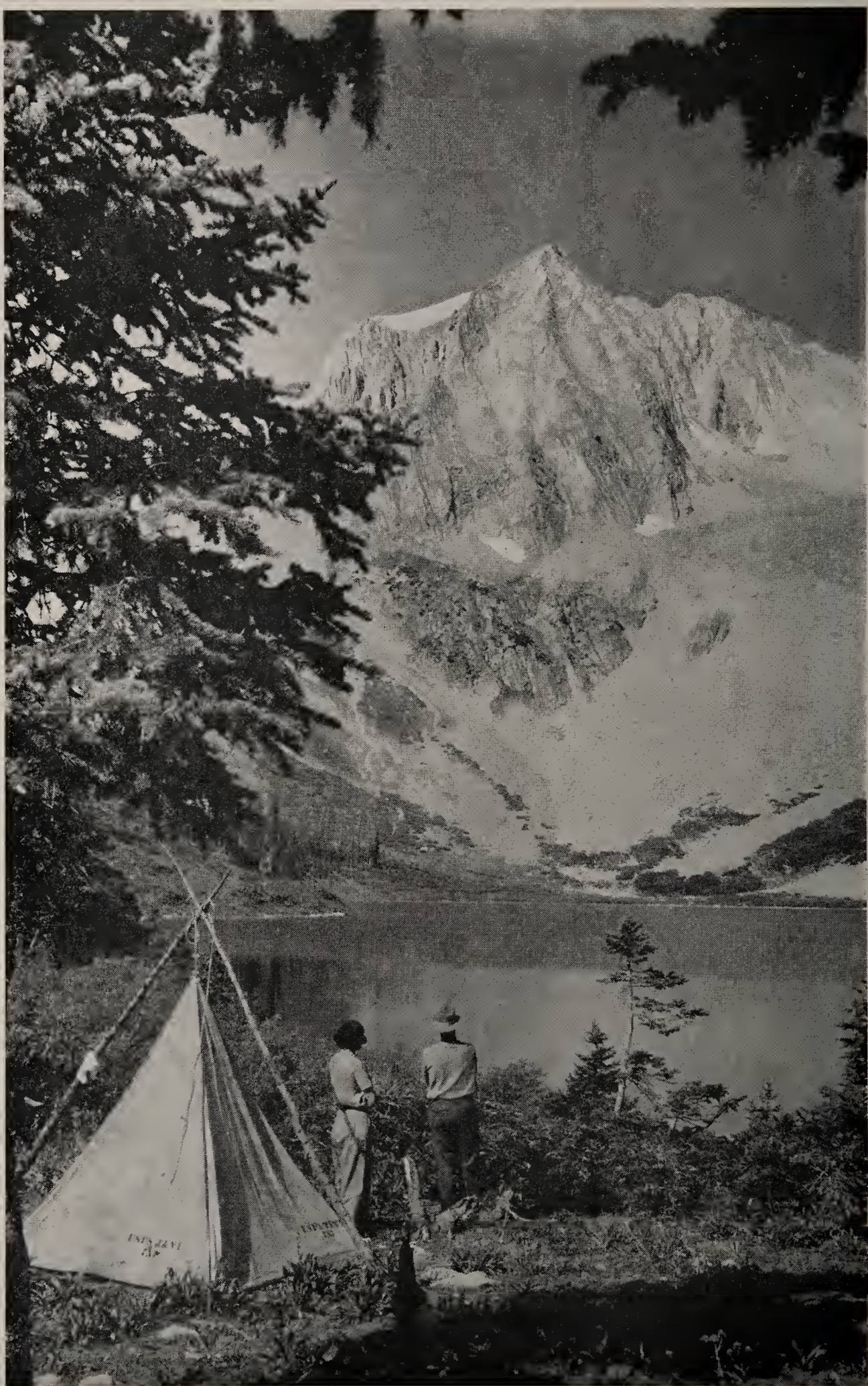
EASTERN ARBOR VITAE (*Thuja occidentalis*). The Arbor Vitae is often an unsatisfactory winter evergreen, even in moister climates than Colorado, frequently adopting an ugly brown color in cold weather. In Colorado there are few specimens indeed that are desirable plants. However, there are three clons of the Eastern Arbor Vitae which occasionally do quite well in Denver if planted on the north or east side of a residence, namely, the PYRAMIDAL, the WARE and the WOODWARD. The WOODWARD is a natural globe, of dwarf proportions. The WARE forms a broad pyramid 12 to 15 feet high, while the PYRAMIDAL forms a slender column, 15 to 25 feet high and but 4 or 5 feet in diameter. Two nice specimens of this tree are shown in the accompanying cut. Some of the Colorado nurseries are making grafts from the more successful Arbor Vitae trees, in the hope of building up a thoroughly hardy Colorado strain. The same is true of the Oriental Arbor Vitae (*Thuja orientalis*).

FALSECYPRESS (*Chamaecyparis*). This evergreen has somewhat the same general appearance as the Arbor Vitae but does not change materially in color in winter, and for that reason is preferable to the Arbor Vitae—when hardy. However, very few specimens of this tree are to be found in Denver. Sawara Falsecypress (*Chamaecyparis pisifera*) is worth a trial for those who like to gamble. Of course it should be placed where not exposed to south and west sun and winds.



Cut loaned by D. Hill Nursery, Dundee, Ill.

Hill Silver Juniper.



Hagerman Peak and Snowmass Lake.

Photo by U. S. F. S.

The Green Thumb

JULY-AUGUST, 1947

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The Green Thumb

A Bulletin of the
COLORADO FORESTRY AND HORTICULTURE ASSN.
Organized in 1884

GEORGE W. KELLY, *Editor*
MISS ALICE WOOD, *Assistant to the Editor*
L. C. SHOEMAKER, *Treasurer and Custodian*

1355 Bannock St., Denver 4, Colorado—Phone TAbor 3410

"To preserve the natural beauty of Colorado; to protect the forests; to encourage proper maintenance and additional planting of trees, shrubs and gardens; to make available correct information regarding forestry, horticultural practices and plants best suited to the climate; and to coordinate the knowledge and experience of foresters, horticulturists and gardeners for their mutual benefit."

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VOLUME IV

JULY-AUGUST, 1947

NUMBER 4

OFFICIAL OPENING OF HORTICULTURE HOUSE

All members and friends of the Association are invited to visit Horticulture House, 1355 Bannock, any time from 11 A. M. to 9 P. M., July 12 and 13. There have been many delays in completing arrangements, but we are now opening the library for use and making the other services available for our members' convenience.

Here you will find books and bulletins on all horticultural subjects; an herbarium of native and cultivated plants; good pictures to help you identify the plants in your yard and the mountains; catalogs of horticultural products and a complete file of current forestry and horticultural magazines. There will be experts on duty to help you find what you want and enjoy your visit. The beauty and utility of the house will thrill you.

Activities indoors and outdoors for the next two months will include the following: As suitable speakers or pic-

tures are available there will be special meetings arranged and announced.

There will be no panel discussion meeting arranged in July.

July 20. Study of alpine flowers. Public trip, joint with the Colorado Mountain Club, to the Mount Goliath Wild Area above Echo Lake. Mrs. E. R. Kalmbach will be leader.

Aug. 2-3. Botanical study and collection trip to the Loveland Pass area. Mr. and Mrs. Earl Davis will be leaders. Details of the trip may be had by phoning Horticulture House a few days in advance.

Aug. 9. Panel discussion on seasonal topics at Horticulture House.

Aug. 17. Public trip to study gardens in the Denver area. Helen Fowler will be leader. Details can be obtained later.

Aug. 30 to Sept. 1. Botanical collection trip to the Gore Range Wilderness Area. Charles Brown, guide.

To complete bound volumes we need a few copies of the following back numbers of the Green Thumb: Vol. 1, Nos. 3, 4 and 5; Vol. 2, No. 1. We will be glad to pay 25c for any of these issues.

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NATURE TRIPS

Seventeen people spent a wonderful day, Sunday, June fifteenth, on the scheduled Wild Flower trip planned for that day. Miss Maud Reed arranged a fine breakfast for the party at her outdoor fireplace west of Boulder, then she conducted us over the foothill and mountain roads where she had scouted out the finest places to see the usual and unusual flowers. Seventy-nine different flowers were listed, several of them seen for the first time. In the afternoon Miss Hazel Schmoll of Ward, Colorado,

showed us some of the grand spots on her Range View ranch. All agreed that it was a privilege to be able to attend a trip conducted by such people in such wonderful country, and that many more people would appreciate attending future trips. Watch the schedule published each month in the Green Thumb and mark your calendar. Let us know a few days in advance so we can assist in arranging transportation. Let us know of other expeditions in town or hills that you would like to have us arrange.

THE IRIS IN COLORADO

BY J. D. LONG*

THE popularity of Iris is increasing by leaps and bounds as the saying goes, the world over. This is because the size, types and colors have been improved so amazingly as to little resemble the original old time "Flags" of way back when.

Since the Iris is a sun loving plant, and thrives best in a rather dry climate, Colorado is the ideal state in which to grow and enjoy this exceedingly lovely flower.

For the greatest enjoyment, plant named varieties of Iris, and keep them labeled. In addition to labeling the varieties, take a little more time to make a "map", showing location in your planting of each kind. Labels sometimes "walk off". Your map, filed in the lower bureau drawer, tells all.

There are various types, classes, and groups of Iris. I grow and am talking about the most popular and universally grown group, the Tall Bearded Iris. Others are very charming also. The Fall Bloomers have never done well in my gardens, so I discarded them. But they are popular and in demand. I think they perform better somewhat farther south. Here they didn't bloom much, if any, in the fall.

In the Tall Bearded class, new colors and combinations of colors are now to be had that few, if any, of us ever dreamed would be found in Iris. Size, substance and habit are all improving.

What seems to be the greatest sensation in the Iris world is the now world-famous Iris, ELMOHR, originated in Colorado by Dr. P. A. Loomis, of Colorado Springs, who has a number of other praiseworthy originations to his credit.

This Iris, ELMOHR, has immense



J. D. LONG

blooms, described as Bishop's purple, or wine-red. It seems to have just about everything else that goes to make a near perfect Iris; substance so heavy that the blooms stand much heat and storm; form, all that could be desired. According to an article in a bulletin published by the American Iris Society, ELMOHR won the coveted Dykes Medal in the shortest time

after it was introduced, of any Iris. Moreover, the votes for it amounted to a near landslide.

Speaking mostly to Coloradans, I feel it is not out of place to stress this data re ELMOHR. It reflects great credit not only to its originator, but draws favorable attention from all over the world to Colorado. Just one more "plug" for good old Colorado.

Iris is fragile, and must be handled with care. But it seems that few understand that it can be cut in bud and will open up perfectly in the house, lasting for days, if plenty of buds are on the stem, and the faded blooms are picked off, the same as with Glads.

You can even ship Iris in the bud, but be sure to send only buds, and pack them DRY. I do not recommend it, however, for shipping in a big way.

There are no pure pinks, no clear dazzling reds, yet, in Iris, like in Roses, Sweet Peas, etc. But hybridizers are getting nearer these goals from year to year. In the meantime, feast your eyes on other colors that are rarely found in other flowers.

*Mr. J. D. Long is a pioneer Iris grower of Boulder, Colorado. He introduced Dr. Loomis' *Elmohr* — the Dykes Medal Winner in 1945. Mr. Long has generously allowed us to use his plate of *Elmohr*, which appears on the cover. Mr. Long advises us that he will be happy to mail a large size color plate of *Elmohr*—if anyone cares to drop him a post card so requesting.—Editor.

In Colorado the Iris is practically free from pests. No insects attack the blooms. Rarely indeed is found the borer, which causes loss in many other sections. No winter protection whatever is needed here. The roots (rhizomes, strictly speaking, or "toes" loosely speaking) do not "heave" in winter, and die.

Furthermore, even the grasshoppers don't arrive in time to feast on the blooms. They may eat the leaves to the ground, but chances are they will not prevent new blooms the next year.

I have a four-page leaflet on Iris culture which I shall be glad to send anyone on request. A few "high spots" are as follows:

Open Season for Iris. Iris may be reset any time when ground isn't frozen. Best time is from midsummer to early September so the roots become well established before winter.

The Iris increases by new shoots forming from eyes or buds at the sides of the divisions or "toe" planted. In most selections the new shoots make new divisions strong enough to reset by early July the next year.

The main idea is to get the new Iris plants well established before winter. Many of the most satisfactory results I've ever had were from September and October plantings, hilled up and protected.

Set roots 12 to 16 inches apart according to room. The closer they are set the sooner they will need to be taken up, divided and reset. Even at 12 inches they should bloom three years before being thinned or reset.

Cover rhizomes a little over an inch. They like it near the surface. Tramp on the fleshy part of the root (the rhizome) and tramp hard after it is planted. Keep watered for a few weeks until new growth starts. Don't worry if the small thread-like roots are dried up when planting. New roots will start at once from the rhizome. If no rains, see that the ground doesn't dry out too much.

Iris can't stand wet feet. Always see that no water stands on them. If soil is

not sandy, then better raise the beds or rows before planting, so good drainage is assured.

To guard against pests and disease I go over Iris that have been planted a year or more, and with big shears cut tops off close to the ground late in fall. Haul off tops and burn them, using kerosene.

Contrary to what seems reasonable, the Iris rhizomes can lie around in the air and sun for days, after which they will grow and thrive all the better for this "sun tan." In fact, one of the best treatments for diseased rhizomes is to dig them up, cut out all bad parts, then let the roots lie in the sun for some days before replanting.

Take notice how the rhizomes work themselves up to top of the ground if you let them. They crave air and sun. For late fall planting, when the roots are practically dormant, the tops may be cut back close to the roots.

July and August plantings require more attention and care than fall plantings. You have the matter of watering and excessive heat to deal with. Your newly planted Iris need moisture at the roots—preferable under the thick, fleshy part, the rhizome.

Avoid pouring water on the plants in hot weather, or letting water run over them or settle around them heavily. I lost some very high priced kinds some years ago by scalding the plants—let the water run too close and too long. A good plan is to make a small circular trench around the plant and away from it a few inches, pour a pint or so water into the trench. After water sinks into the soil fill trench with dry soil.

Rhizome rot is caused by lack of drainage, too much rain or irrigating, followed by hot weather, or other weather or soil conditions. Usually the disease does not spread much and Nature will check it. Often only part of clump will perish. White maggots may be found in the diseased portion, but they are not the cause. They are the cure—or one cure. They eat out the diseased parts.

But first aid can be given by scraping away the soil and exposing the damaged portion of the rhizome. Then scrape off all the rot and coat the surface heavily with powdered lime, sulphur, or a preparation farmers use for the control of smut in wheat. Do not put back the soil for a few days. Give the exposed rhizome air and sunshine.

What about lime? We hear lots of talk about lime for Iris. Don't believe ALL you hear. Depends on your soil—whether already acid or alkaline. Lime increases alkaline condition. Too much alkali is bad—very bad, for most plants. Locks up nourishment so your plants may starve in the midst of plenty. A neutral or slightly acid soil is preferable. If in doubt, leave it out. Eastern soils seem to run more to acid than our Colorado soil, and may need some lime. Use discretion. Go easy.

Warning! Don't let blue grass or other grasses or weeds get into or close to your Iris plants. They spell disaster.

After all is said and done, the Iris is almost fool proof, and success is practically certain, even if many of these suggestions are overlooked or disregarded. I sort of hesitate to give such a "Long" list of things to do or not to do, lest you think Iris growing is difficult. Not so, it's easy and it's fun.

Mr. Kelly has requested me to give a list of twenty-five outstanding Irises. Of course selecting the most beautiful Irises

is like choosing the most beautiful girls—opinions differ. However, since the request has been made, I will say that if anybody had each of the following Irises in his garden, he would have a great show and it wouldn't be too expensive besides (with the exception of Elmoehr, which costs \$2.00, all are \$1.00 or less).

ARCTIC. Gigantic white-gold.

BUECHLEY'S GIANT. Blue bi-color.

CITY OF LINCOLN. Giant gold-red.

CLARIBEL, Giant white, edged blue.

DERRILL HART. Rose-bronze-wine.

Big.

ELMOHR. Mammoth wine-red.

GRACE MOHR. Colossal lilac.

INDIAN HILLS. Glorious true purple.

JAKE. Grand white by Jacob Sass.

LIGHTHOUSE. Giant rose. Gold Heart.

LILAMANI. Velvety blackish self.

MARQUITA. Cream Pink markings.

MIDWEST GEM. Delightful buff-pink.

MING YELLOW. Sensational giant.

MISS CALIFORNIA. Stately pink.

MISSOURI. A Dykes medal blue.

MOROCCO ROSE. Super giant pink.

NYLON. Fine copper-tan self.

ORMOHR. Mammoth lilac-lavender.

PIUTE. Bright red tone self. Fine.

RADIANT. Brilliant coppery-red.

SANDALWOOD. Army-brown blend.

TIFFANY. Yellow. Rose stitching.

TREASURE ISLAND. Giant golden-rod.

WABASH. White-purple amoena.

DO YOU SAVE YOUR GREEN THUMBS?

Have you noticed how informative and instructive the Green Thumbs are? Recently I have had occasion to examine Horticulture House Library's bound volume of the "Thumbs" for the last three years. I found it a fine handbook for gardeners in this Rocky Mountain area.

True, I have read and enjoyed every issue as I have received it, but there have been many questions regarding planting, spraying and such that have recently arisen, and in going over the

bound volume I found that most of these questions were completely answered. I thought that I would like to have my issues bound in a similar volume, and it occurred to me that if a number of members went together in having this done that the cost might be considerably reduced.

A Member.

Ed. Note. The cost would be around \$3.00 depending on binding and the number ordered at one time.

Simple Simon's Adventure

Young Simple Simon wanted to sleep,
 He wanted to sleep, perhaps to snore,
 But he couldn't do either, for *chiming* bells
 Were chiming too loud outside his door.

He, therefore, went to hunt for flowers,
 Out o'er the verdant hills, afar;
 He did not have any weapon to use,
 So used, instead—a *shooting star*.

He had not seen any liquor that day,
 A fact to which he could stoutly swear,
 But, nevertheless, as he hurried along,
 He saw *pink elephants*, everywhere.

A *black-eyed susan* nodded and smiled
 As he approached her hillside bower;
 He simpered and said, "Good mornin', miss!"
 Forgetting—b'gosh—that it was a flower.

He caroled, "*Dear Daisy*, I'm half crazy!"
 But alas, he met with sad disaster,
 For shortly he learned that his daisy dear
 Was just her fickle cousin—an *aster*.

A *golden banner* he hailed with delight,
 He thought he'd found a flag of the free,
 But an *iris* explained that *she* was the flag
 And golden banner was only a pea.

A *gentian* he plucked for a drinking cup,
 But its fringy edge tickled his nose;
 He swapped it off for a big *king's crown*
 To wear next day with his Sunday clothes.

He wanted an orchid to take back home—
 A pink *calypso* or coral root—
 Instead, he chose a red *trumpet phlox*
 But quickly learned that it wouldn't toot.

The scent of *primula* made him pause
 To pick a few for his mother-in-law;
 But he didn't because one whiff was enough
 To make him fight his pappy's buzz saw.

So sorta bewildered he scooted for home,
 The posy technique he couldn't untangle;
 But some day he plans to go out again
 And tackle those flowers from another angle.

—Len Shoemaker



QUAKING ASPEN AS SEEN BY THE WATERSHED RESEARCHER

B. C. GOODELL¹

EVERY autumn traveler through Colorado's mountains has thrilled to the sight of green and gold hillsides where conifer and aspen blend their foliage. By seasons, the beauty varies in brilliance as weather sequences mute the tones or give full play to colors drawn, in appearance, from veins of pure gold lying at root depth. The summer hiker finds his spirits soar and his steps lighten when, after traversing somber miles of pine or spruce, he enters the bright daylight of an aspen stand and treads a flowered carpet among silvery boles and under a twinkling emerald canopy.

The watershed manager is not obliv-

Water in cold storage. The greatest value of the Grand Mesa is its water.



ious to these beauties. He is spiritually glad when his work requires attention to all native forest types, for each has its beauties and the enjoyment of each may be greatest when all are embraced. However, the watershed manager must ask practical questions of these forest types—questions not answered by aspects of beauty but only through prosaic numbers obtained from carefully planned studies, careful measurements, and intricate analyses. Being primarily concerned with getting the maximum usable streamflow from his watershed, he must ask a variety of questions about the precipitation which falls on the aspen stand. How much of the annual snow and rain is intercepted by the crowns and held until evaporation robs it from potential streamflow? Does the aspen stand provide the right conditions for protracted snow melt so that the spring streamflow will not be too rapid and brief? Do the life processes of aspen trees, as expressed in root development and leaf composition, favor the formation of a soil which will absorb precipitation and be stable against erosion?

It is one of the principles of ecology that plants and animals tend to live and grow together in rather definite groups or associations. Growing under aspen we commonly find certain herbaceous plants which are favored forage for cattle—animal members of the ecological association wherever they are allowed to become so.

To complete his knowledge of the aspen type, the watershed manager is interested in how cattle-grazing influences the watershed qualities of the type; whether the seasonal removal of part of the herbaceous vegetation allows more rainfall to reach the soil surface, to be

¹ Forester, Rocky Mountain Forest & Range Experiment Station. Maintained by the U. S. Department of Agriculture, Forest Service, in cooperation with Colorado A & M College, Fort Collins, Colorado.



Measuring snow for its water content.

eventually reflected in increased stream-flow; and whether any increase in net rainfall is offset by changes in evaporation and transpiration.

These are not complex questions such as chemists and physicists ask of substance. But chemists and physicists work in laboratories where everything is in their control, even the atom. One just doesn't ask such complex questions of nature and expect answers. Nature is too variable, and single or even a few factors cannot be isolated from all others.

The statistical approach must be used in which variation is expected and used. Variation cannot be eliminated but can be separated into types, uncontrolled variations due to unknown factors, and other variations caused by controlled or measured factors such as kind of forest cover, cattle grazing and so forth. Comparisons between the two types, controlled and uncontrolled, give us our answers.

And we do have answers to these queries of the aspen forest type, answers

which give aspen a grade of excellent in a rating of forest types on their watershed values.

More snow falls and stays on the ground under aspen than under lodgepole pine, and fully as much as in large forest openings. The winterbare branches catch negligible snow to be lost by evaporation. But these same bare branches and the tree boles do slow down the often dry winter winds and so reduce the evaporation loss which occurs from the snow blanket surface.

The snow under the aspen melts at about the same rate as that under pine, but under both it melts more slowly than in open areas. Here again, the aspen stand slows down the movement of winds, now warm and bearing the brunt of the job of clearing the soil for spring activities. True, more sunlight can enter the aspen than the pine stand, but sunlight is largely reflected from snow and from light-colored surfaces such as aspen tree stems. It is effective in melting snow only when absorbed by dirt-darkened

snow or by other dark surfaces such as the boles of pines.

More summer rain penetrates the aspen canopy than the pine, even though leaves now complete their beauty. Of course, both the aspen and pine intercept considerable summer rainfall, but the aspen crowns hold only 16 percent of that which falls on them, while pine crowns catch 23 percent. Here you may start to wonder. You may ask, "Yes, but how about the rain which runs down the twigs, branches, and trunks of the trees and so to the ground?" We wondered too, so we measured. We know that "stemflow" of rain water is important on some tree species, that as high as 14 percent of the rain falling on the canopy may reach the soil by this route. But with aspen, we found the stemflow to be negligible, only about one percent of the summer rainfall. The branching habits of the aspen are not right to provide channels for the water from twigs to trunk.

It was now known how aspen trees themselves behave toward the snow and rain which falls on and among them, but we still had questions to ask other parts of the ecological association. There remained the questions of how cattle-grazing on the herbaceous vegetation affected the rain fall reaching the soil surface and how evaporation and transpiration are affected. So we measured the rainfall penetrating the ground cover of grasses, sedges, legumes, and the representatives of many other plant families. Very small rain gages were slipped in under the leafy foliage and among the stems on both sides of a fence which enclosed a large area within the aspen stand. We measured the catch in these gages after each rainstorm. In the fall samples of the soil were taken and analyzed for their content of moisture.

We carried on these measurements for 3 years and what did we find? No effects! Or, in other words, moderate grazing as was practiced here has no

appreciable influence on rainfall reaching the soil nor on losses in soil moisture from evaporation and transpiration.

To help explain grazing effects which might have been found, we had made a survey each year of the species of plants found on each side of the enclosure fence and had estimated the percentage of ground coverage by each species on numerous small sample plots. This information is of interest, aside from its relation to rainfall and soil moisture. We found that grazing had definitely reduced the number and extent of ground coverage of several common plant species, including the following: dandelion (*Taraxacum officinale*), strawberry (*Fragaria*) vetch (*Astragalus* sp.), fireweed (*Epilobium angustifolium*), Drummond thistle (*Cirsium drummondii*), geranium (*Geranium richardsonii*), and grasses. The one species which showed an increase under grazing was the loco weed (*Oxytropis* sp.) Considering the totals of all species, the ground coverage by plants at mid-season on the grazed area was only about two-thirds of the coverage on the ungrazed area.

Lastly, we needed to answer the question as to what kind of soil structure is produced by aspen and its associated plant and animal life. Is it a structure which is open to the free entry of water, or is it such that rain and snow-melt water runs over the surface and starts erosion? This question could be answered by observation without repeated, careful measurements of passing things like winter snow and summer showers. The soil is relatively fixed and slow to change. So visits were made to many aspen stands here and there in the mountains, and the soil structure was observed and notes made on any signs of past or present run-off. A porous, highly permeable soil structure with no signs of erosion was the condition everywhere *except* where over-grazing by cattle or sheep had been so intense as to destroy partially the herbaceous vegetation and compact the



Snow interception by pine.

soil. Under such abuse by livestock, neither aspen nor any other vegetational type can maintain itself and hold the all-important soil.

We have the answers on aspen. When considering watershed values, there is no longer a question as to whether certain areas of aspen forest should be converted to a pine or spruce forest to increase streamflow and further insure against soil erosion. We can't now sit back and relax, however. There are other problems of even more importance. Results from other research lead us to believe that streamflow from high mountain watersheds can be very materially increased through judicious cutting of mature pine and spruce timber and the proper thinning of young stands of this timber. It appears to us that this can be done over large areas without starting soil erosion, and in good agreement with the best methods of managing timber for maximum growth and lumber production. We believe these things, but they must be tested more extensively.

We must prove them not for just one area and set of conditions, but for the many watersheds from which water, the life blood of the West, emerges to supply our cities and our irrigated fields.

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FEEDING

Where every inch of ground is used and a carpet of plants and bulbs is put under shrubs, the matter of feeding comes to be a problem, after nourishment, incorporated in the ground at planting time, is exhausted. Established shrubs may be kept in good condition if given a ration of 3 needed elements in equal quantities:

Nitrate of Soda
Acid Phosphate
Muriate of Potash

mixed 24 hours before used. Put a handful of the above in bottom of holes, made by a crowbar at a distance of 12 inches from the base of the shrub, 18 inches apart.—*Helen Fowler.*



Everybody works. Lunch stop on the way home. The blotters on the specimens must be changed daily.

THE NARRAGUINNEP NATURAL AREA

BY GEORGE W. KELLY

AT 7:30 A. M. June 30 a party of four hardy botanists left Denver to explore the 2800-acre Narraguinnep Natural Area of the San Juan National Forest north of Dolores, Colorado. The party consisted of Kathryn Kalmbach, who kept the collection records; Anna Timm, who provided the wonderful food; Alice McWhinney the official shopper; and George W. Kelly, driver and camp flunkie. At Dolores we were joined by Lucy Hastings who immediately made herself indispensable in many ways. Before midnight June 7 we had covered over one thousand miles in the little Chevrolet pickup, and collected around two thousand specimens. The native flowers and plants were at their

prime in many places along the route, and samples were taken at suitable locations every few miles. Most of the trip we were surrounded by grand snow-capped mountains. Few flowers were found in the high country, however, as it was too early. Along the Gunnison River, between Gunnison and Montrose, we found a great variety of flowers and blooming shrubs. The area near the Black Canyon of the Gunnison was especially rich in unusual plant varieties.

Along the Dolores River and on the mesas above the Narraguinnep canyon we found wonderful displays of flowers—some rare ones. The Narraguinnep Natural Area proper was a little dissappointment, as it was a rather monotonous

Pictures on opposite page →

Camp at the head of the Narraguinnep canyon. A little welcome sunshine to dry clothes and specimens, following a day and night of rain.

The Narraguinnep natural area from the ridge on the south. The part of the canyon included in this area is about five miles long and one and a half miles wide. It is a steep-sided V covered with oak brush, with a few areas of aspen and scattered mature Ponderosa Pine. The stream in the bottom is alternately in flood and almost dry.

The historical marker at the site of old Fort Narraguinnep.





Typical rock formation along the Dolores River Below the Narraguinnep. Probably the dark opening in the center was once a cliff-dwelling.

canyon of steep oak-covered slopes and little botanical variety. The purpose of this area being set aside was very commendable, as it is in the farthest southwest part of the U. S. Forest in Colorado. Actually we found many more of the "typical" south-west plants in the surrounding country. We did get a rather complete list of the plants found within the boundaries of the area, as well as samples of all the plants for our herbarium. We had planned to call on all members of the Association in that part of the state, and possibly arrange meetings where we could get acquainted with them; but this did not work out, as we were rushed for time to make the circuit as it was, and much of the time were in no condition to be seen. As soon as time is available we hope to go down there again and spend more time in the towns and with the residents.

Our observation was here, as in other parts of the state, that the local residents have not made sufficient use of the native and available cultivated plants. We found many fine native plants which had apparently never been cultivated, and a few progressive people had ex-

perimented and found that they could raise a much greater variety of plants than their neighbors supposed. With such a wealth of natural beauty possibly many local residents have not realized the advantage of adding anything around their settlements. When no effort is made to beautify, however, man can so mess up Nature that his communities can soon look drab and dirty. The preservation of natural spots of beauty, botanical interest, or historical value needs to be considered over much of this area. Years from now we will all be sorry if we let valuable natural features be destroyed for lack of a little foresight.

At the lower altitudes coming home we found a wealth of native plants, and secured a rather complete collection for our herbarium. While this was rather a strenuous trip and full of discomforts we all found it very enjoyable and felt that it was a profitable week. The several trips planned for the rest of the season should be well attended. People who are willing to go on such "work" trips, are, we believe the finest in the world.

THE GRAND MESA OF COLORADO

BY ROY L. WILLIAMS

Supervisor Grand Mesa National Forest

JUTTING out from the main range of the Rockies, between the Colorado and Gunnison rivers, rises a flat top mountain, a majestic buttress 6,000 feet above the valley floor, a lava-capped plateau of shale and clay. To the alpinist, perhaps not a challenge; but, withal, rather formidable and unapproachable as you see it from the Grand Valley.

Despite its massiveness, its ruggedness, its sprawling contours, this old dowager maintains a certain vaingloriousness that has commanded the respect and admiration of red men and white.

It sleeps through the winter with a cap of snow on its brow, resting as it were with this cooling ice cap after a season—in its long history, no more than a day in the riotous march of time.

It awakens in the spring, slowly, reluctantly at first; then noisily as the snow melts, the ice breaks, and the water cascades over the lava escarpment. Nature drapes it for the coming season: a verdant green carpet of grass at its base; a skirt of dark green pinon and juniper; a serpentine midriff covering of mottled oak; with a necklace of trembling aspen in yellowish green, topped with a crown of Engelmann spruce—a magnificent spring-time ensemble.

By the middle of June it is fully caparisoned for the season, standing majestically by, as the summer passes. By late August, it assumes a tired attitude; the green carpet at its base becomes brown, lifeless and soiled; the skirt is dusty; the oak has lost its luster; the aspen its sheen. Only the crown of spruce remains unaffected by the rush of the season.

But, as the first touch of frost is felt in the early autumn, there is a stir, an awakening, as the mountain garbs itself for a last and final showing before the

long winter rest. The fall rains wash the carpet of summer dust; freshen the skirt; the mottle serpentine waist is replaced with one of scarlet, the mild yellow necklace by one of gold, and the crown is bright with new growth.

Truly a dashing display of color, changing ever so slightly from day to day, until at last it sheds its brilliant raiment and is covered by a blanket of snow.

There it stands as it has through the ages, as it stood when first sighted by Father Escalante in 1776. Whether he saw it in gala dress or from the trail at a distance and was awed by its magnitude matters little. For, as he looked at this mountain, with its flat top, dividing the two rivers—the Gunnison and the Colorado—and the Indian hunters returning to their camps along the streams, his words, "Mesa Grande," gave to the mountain a fitting name, a tribute to nature and to the importance which the mountain was to play as civilization and settlement moved in a hundred years later.

And move in it did. No sooner was the last of the Ute tribe on its way to the Utah reservation, than the dust from emigrant wagons appeared on the horizon. They came singly and in pairs, in trains of Conestoga wagons, prairie schooners and carts. Horses, mules and cattle; men from Kansas, men from the East, single men, men with families; young and old in search of new homes, new land, new opportunities.

They followed the Indian trails, they camped where the Indians camped, and they settled under the protecting brow of the "Mesa Grande."

They brought furniture, farm equipment, seed; and above all they brought



They looked to the Grand Mesa for water

energy—energy born of faith in themselves and a firm belief that, by hard work, they could conquer all obstacles. They established towns, schools, and churches. They built houses, they plowed the land, they raised crops, and they learned, these people from the East. They learned that the soil was good, the growing season long, and that anything—hay, grain, fruit or vegetables—would grow when irrigated.

They looked to the Mesa for water, diverted the streams to the land. More settlers arrived, more land developed,

more water needed. They followed the streams to the top, searching for more and still more water.

They found water, these farmers and fruit growers; they found the Mesa top dotted by hundreds of beautiful lakes. They found excellent watersheds, the soil protected from erosion by grass, ungrazed and undamaged. They found the watersheds covered by extensive stands of Engelmann spruce. They examined these watersheds in the winter and found an unbelievable amount of snow—water in cold storage. They examined the



l the streams to the land and it bloomed.

streams in the spring, and found the lakes could not hold the surplus.

They found this water, so clear, so cool, so pure, running uselessly to the rivers, yet so badly needed on the land.

They built roads, they located trails, they pulled, they hauled, they packed equipment to the lakes. They constructed dams at the outlets to hold the water from the melting snow so it could be delivered in an orderly manner through the growing season to the land.

The more accessible lakes were developed first, then as more land yielded

to the plow, as more orchards bloomed in the valley, as towns grew, more water was necessary and more lakes enlarged. Reservoir sites were selected, more storage provided.

All of the men who examined these lakes and the watersheds were not farmers or fruit growers. Many were stockmen; and the grass, the virgin range did not go unnoticed by them. Gradually at first, but later in eager competition, they pushed their herds by the thousands on to the Mesa. They followed the retreating snow in the spring, re-

maining until the snow in the fall forced them down.

Suddenly the scream of the iron horse was heard in the Grand Valley. It ushered in the age of exploitation and competition. The Mesa returned the challenge in an echo of rage.

The age was here: farmers, stockmen, timbermen, business men, and engineers, towns and communities became competitors for the blessings of the Mesa—selfish and careless, exploiters of a national resource. Poorly constructed dams and ditches gave way from time to time, causing erosion of the stream beds; fires nibbled at the protective timber on the watersheds. Livestock were rapidly de-

Hightower Creek at flood stage. In 1880 this stream flowed steadily all year long; water was clear and afforded excellent fishing. Today, due to overgrazing, there is a heavy spring runoff of muddy water and it is dry most of the time.



stroying not only the range grasses, but the soil itself, and causing widespread erosion and irreparable damage.

As if in answer to the echo of rage, the "Great White Father" declared the Mesa a forest reserve.

The creation of the reserve nettled the stockmen, though the more thoughtful foresaw the future benefits of the move. But more and more cattle were pushed on to the Mesa during the next decade in the competitive scramble for these benefits. They grazed the watersheds, the open parks, the steep slopes, the very grass roots, aspen and brush, in a concerted effort to get everything before control could be established. Timber operators and water users followed the same policy, and fires continued to nibble at the forest cover.

At the turn of the century, an administrative agency came into being, the Forest Service, a new agency created for a new job. Its first men were inexperienced, but men with ideals, men who subscribed to the policy that the national forests belong to the people and not to organized minorities, that they should be administered to provide the greatest good to the greatest number in the long run.

When this infant organization assumed control of the Mesa they, too, stood in amazement at what they saw—not the color scheme or gala dress, not the bulging, sprawling mountain; but the magnitude of the job facing them—protection of water sheds, regulation of grazing, harvesting of the timber, and the blending of this great resource into the economy of the valley.

They found the velvet, verdant carpet at its base worn and made threadbare by overuse, the skirt of green torn and tattered through uncontrolled cutting. The midriff of oak still retained its color, but it was ripped and ravelled by eroding roads and trails; the necklace was broken in many places, and the crown bent and battered from fire and timber cutting.

They found some streams which once



Above—The Mesa Lakes, Water in storage, the life blood of the Valley.

Below—Island Lake and adjacent reservoirs at the head of the Ward Creek watershed.





Depleted and damaged range on the Kannah Creek watershed which supplies the city of Grand Junction. Note the weeds which have replaced the grass, the loss of soil, the absence of reproduction in the opening.

ran clear now already turbid and shallowed; they found ranges depleted; grass replaced by weeds and brush; incipient erosion; and the watersheds which meant life to the valley endangered through the apathy or selfishness of man.

The organization has grown; it has learned. It has had 40 years of experience, and is bringing order out of chaos. It has met and continues to meet resistance—organized resistance by minorities who would sacrifice the welfare of the valley, the water supply of cities and towns, even the future of their own industry for an immediate gain or to maintain the *status quo* on the watershed range.

Civilization has, of course, softened the old mountain. Good roads have been constructed for the traveling public, for the maintenance of water facilities and regulated harvesting of timber.

The Mesa needs help. The Forest Service needs help in bringing home to the people of the valley the fact that it

holds their destiny in its snow banks, its lakes, reservoirs and streams; that it is entitled to the greatest reverence, respect, and protection that can be bestowed upon such an object by an enlightened people. For it is as Father Escalante said, truly the "Mesa Grande".

THE COLORADO WHITE CANE LAW

The United Workers for the Blind of Colorado asks your organization to give publicity to the white cane law which came into force in Colorado on the 26th day of April, 1947.

This act restricts the carrying of a white cane in public places to persons wholly or partially blind, and failure to heed the approach of a person carrying a white cane, or to come to a full stop when approaching such a person, or to take precaution against accident or injury to such person after coming to a stop, as provided by this act, is a misdemeanor punishable by a fine of not to exceed one hundred dollars.

HOW PUBLIC ARE GRAZING LANDS?

BY FARRINGTON R. CARPENTER

THE American Continent was settled under laws which provided that public lands should go into private ownership as speedily as possible and should belong to the particular class of people who could make best use of them. Thus townsite entries went to prospective city makers, mineral lands to mining promoters, timber lands to lumber men and farming lands to homesteaders. These laws never contemplated the theory that public lands were for the direct use of "all the people of the United States" or that private ownership was an evil.

As the tide of settlement swept from the Alleghenys to the Pacific Coast, nature herself interposed obstacles which blocked the orderly transference of the public lands in the eleven western states from public to private ownership. The obstacles were of two kinds: mountains and deserts.

Even to this day, less than 10% of the land in the eleven western states is capable of cultivation and more than half of the entire area remains in public ownership.

Ninety percent of the lands of these eleven states which is capable of any agricultural use is chiefly valuable for grazing of livestock.

Back and forth from the high mountain summer ranges to the low deserts travel millions of sheep and cattle every spring and fall, crossing state lines and often going hundreds of miles to their natural and seasonal pastures. As a great inter-state movement its regulation falls naturally to the Federal Government.

Early in this century the danger of allowing the ordinary land laws to apply to the high mountains which were the water shed divides, became apparent and the Government created the present Forest Reserves. No one—least of all the stockmen who know these Reserves better than any other class—would advocate opening up these Forests for settlement or sale. There are some *adjoining*

tracts which are valuable neither for timber or water control which should be eliminated from the Forests, but those tracts are situated chiefly in New Mexico, Nevada and Arizona, and there is a comparatively negligible amount of such land in California, Colorado, Idaho, Oregon, Montana, Wyoming and Washington. This segregation should be done impartially and in a scientific manner. Opposition to this comes from those who mistake such a move for "an opening wedge" to despoil all Forests, and from the Government Bureaus who openly declare that no land shall ever be taken away from them "except over our dead bodies." Neither of these objections is valid.

What about the great Deserts of America? The Red in Wyoming, the Owahoe in Idaho and Oregon, the Harney in Nevada, the Mohave in California and Arizona and the Great Salt Lake in Utah and Colorado, and the Jorandab in New Mexico. In extent they comprise nearly 200 million acres (for comparison New York State has 15 million acres). They are dotted and pock-marked with State Lands, Army Air Targets, Ammunition dumps, Department of Commerce Air Landing Fields, Indian Reservations, Game Refuges, National Parks and Monuments, Naval Oil Shale Reserves, Agricultural Experiment Stations, Power site withdrawals, Railroad alternate section grants, State lieu land selections, water hole filings and tens of thousands of pieces of script and homestead filings.

Approximately 50 million acres known as the Creosote Desert is worthless for any agricultural use. Some 50 million more acres are so isolated and controlled by privately owned lands and water as to be impractical of Government administration. These latter lands should be sold under an amendment to the Isolated Tract Act, to the highest bidder at pub-

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Wheatridge

Mrs. Helen K. Fowler (L)
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 Mrs. L. L. Johnson (S)
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HOW PUBLIC ARE GRAZING LANDS?

Continued from Page 21

lic auction and thus be placed on the tax rolls and help support schools and local government.

Probably 75 to 100 million acres of so-called "deep desert" have a low value per acre for grazing, too low to justify payment of local property taxes. These lands are now in Taylor Grazing Districts and should remain there and be

administered by the Federal Government.

These are the actual facts about the controversy which the two Stockmen's Associations have stirred up. The decision will and should be made by the Public Lands Committee of the House of Representatives where the whole matter can be presented and worked out.

JULY-AUGUST WORK IN THE GARDEN

PROBABLY the most important thing for gardeners to watch out for in the next two months is insect damage. Usually when plants have had a very favorable growing season the bugs have also grown vigorously. It seems that we always have the aphid (plant lice) with us. Look for them on Delphinium, Spireas, Colorado junipers and many other plants. Nicotine (Black Leaf 40) is still a most effective and safe insecticide to use. Usually a spreader such as soap chips is advisable to be used with nicotine to make it stick.

Red spider and the green spider-mites begin to show up as the weather gets warm. They may be on currants, Cinquefoil, Thimbleberry and evergreen trees. They have been hard to kill. Now there is a new treatment which seems to give good results. It is tetra-Phosphate. Ask your seedsman for it and directions for using it. DDT is becoming more useful each year as more is known of its powers and deficiencies. A good general spray consists of the specified amounts in a gallon of water of DDT, Nicotine and Sulphur. We are not ready as yet to throw out all the old chemicals in favor of DDT.

We wish that we could give specific directions for the cure of fire blight in apples, but we can give little encouragement. It is not known for sure even whether this is a bacterial or virus disease. Sprays seldom give more than occasional benefits. The approved treatment still consists in cutting out the diseased wood completely in late summer. Blight resistant apple and hawthorn trees seem to be the best answer.

The blight in Poplars can be treated if gone after in time, but it is a technical job, expensive, and not entirely effective. Keep your poplars growing vigorously and they will resist many pests. (To keep your poplars growing vigorously usually means that nothing else will grow in your yard.)

Preparations using 2,4-D are becoming more and more useful. They do effectively kill many weeds when used properly, but must be handled carefully to avoid damage to other good plants. Dandelions and plantain both yield to 2,4-D.

When you listen to a modern insecticide chemist roll off the jaw-breaking names of the chemicals used in fields and gardens you realize that the whole field of insect control, disease eradication, and weed killing is becoming a job for specialists. It would probably pay us to encourage specialists to do these jobs, as they could very likely give us more effective control for our money, but we will all have to know enough about the work to determine when a man really does know his chemicals.

The fertilizer game is also getting pretty technical. Most of us can still understand how to handle manure and mulches though and they are still very effective.

When we have used 2,4-D in every place possible there will still be plenty of use for the old-fashioned hoe to control weeds. Cultivation and mulching usually distinguishes the garden of a person with a good green thumb.

The good gardener will now be doing a lot of little shearing jobs. All the trees and shrubs and hedges that are trying to get out of bounds will need a little pinching here and cutting back there. Now is a good time to do any necessary trimming on many of the common shrubs. Most of them can be kept young for many years if a few of the old stems are removed each year.

A really good gardener sometimes must get hard-hearted and take out a plant which has refused to grow or which has grown too well and is all out of scale.

Chlorosis (the yellowing of leaves) may show up in many plants. Oak, Flowering Quince, Ninebark or Barberry are common offenders. This usually means an excess or deficiency of some mineral in the soil. Sometimes it is a lack of iron, sometimes sulphur, sometimes other things and often an excess of alkalies, or soggy soil. Experiments with supplying some of these things will often locate the trouble.

Take time now to see what your neighbors are doing in their gardens. You can get many good ideas by driving around and looking for effective combinations of plants.

Proper watering is probably the most important job of the gardener now. Here is where a good Green Thumb shows up. If we might make a rule it would be to water less often and more thoroughly, but there are always more exceptions to rules than there are times to use them, so we must learn to test our soil frequently and water according to weather, slope, exposure and character of soil.

Late August is usually the one good time to move Oriental poppies.

There are many plants which will bloom and make a fine showing in May, but take note of those plants which bloom in August and plant more of them.



The Green Thumb

SEPTEMBER-OCTOBER, 1947



The Green Thumb

A Bulletin of the
COLORADO FORESTRY AND HORTICULTURE ASSN.
Organized in 1884

GEORGE W. KELLY, *Editor*
MISS ALICE WOOD, *Assistant to the Editor*
L. C. SHOEMAKER, *Treasurer and Custodian*
1355 Bannock St., Denver 4, Colorado—Phone TAbor 3410

"To preserve the natural beauty of Colorado; to protect the forests; to encourage proper maintenance and additional planting of trees, shrubs and gardens; to make available correct information regarding forestry, horticultural practices and plants best suited to the climate; and to coordinate the knowledge and experience of foresters, horticulturists and gardeners for their mutual benefit."

Published bi-monthly. Sent free to all members of the Association.

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VOLUME IV

SEPTEMBER-OCTOBER, 1947

NUMBER 5

Schedule of Activities

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| Sept. 5. Friday evening, 7:45 at Horticulture House. HERBS AND HERBALS, by Mrs. C. Earl Davis. | Oct. 3. Friday evening, 7:45 at Horticulture House. TULIPS. A discussion by several gardeners. |
| Sept. 12. Friday evening, 7:45 at Horticulture House. Horticultural Panel, conducted by experts. | Oct. 10. Friday evening, 7:45 at Horticulture House. Horticultural Panel, by experts. |
| Sept. 13. Saturday afternoon, 2 P. M. Denver Parks and Gardens. Robert E. More will conduct a study trip especially emphasizing evergreens. | Oct. 17, Friday evening, 7:45 at Horticulture House. TRANSPLANTING HIGH-ALTITUDE SHRUBS AND TREES, by Henry Gestefeld. |
| Sept. 19. Friday evening, 7:45 at Horticulture House. Program by the U. S. Forest Service. | Oct. 24. Friday evening, 7:45 at Horticulture House. Movies of Bird Life, by Ralph Asbury. |
| Sept. 26. Friday evening 7:45, at Horticulture House. FRUITS FOR THE HOME GARDEN, by Chas. M. Drage, Extension Horticulturist, Colo. A. & M. College, Fort Collins. | Oct. 31. Friday evening, 7:45 at Horticulture House. AFRICAN VIOLETS, by three members of the Home Garden Club. |

In Appreciation

Last fall Mr. Lester E. Varian carefully examined a quaint and old, but quite dilapidated, structure at 1355 Bannock Street. It had practically no foundation, little basement, was cut up into small impractical cubbyholes, and plumbing was almost non-existent. But Mr. Varian sensed the *potentialities* of this rude building, and under his masterly touch the metamorphosis progressed un-

til *Horticulture House* finally emerged in its final perfection. Mr. Varian has refused to accept any compensation whatsoever for these months of professional service.

With friends like Mr. Varian, The Colorado Forestry and Horticulture Association cannot fail to achieve its objectives.

Thank you, Mr. Varian.

Botanical Reserves Established

OUR dream of a state-wide system of botanical reserves is beginning to be realized. Through the efforts of George Carlson, superintendent of parks at Colorado Springs, and other members there, there have been set aside three areas of unusual botanical interest. One will be called the ONESEED JUNIPER AREA. This is located in the Garden-of-the-Gods and includes a number of ancient trees of the *Juniperus monosperma*, or Oneseed Juniper. These have been accurately estimated to be from 500 to 900 years old. In this same area are to be found many specimens of the Pinyon Pine and also the typical dry ridge shrubs of this area.

The second area will be known as the WHITE FIR AREA. This is a short distance up North Cheyenne Canyon, in a beautiful pocket in the valley. In addition to some outstanding specimens of the White fir, there are unusually fine specimens of most of the native trees and shrubs of this altitude. These include the Ponderosa Pine, Douglas Fir, Lodgepole Pine and Colorado Spruce. The native Mountain Birch, Pin cherry, Chokecherry, Rock spirea, Hazelnut and low Ninebark are all found here in especially vigorous growth.

The third area is in Palmer Park, and is known as the YUCCA AREA. This is a rather striking nob hill in the center of the park which is entirely covered with plants of the *Yucca glauca*. This area is entirely surrounded by the park roads and makes a spectacular showing when the plants are in bloom.

Plans have been made for a large delegation from Denver to meet with the Colorado Springs members August 27th and officially dedicate these areas as the first three units of the eventual state-wide series. Other communities which have suitable areas in their vicinity should tell us of them so that they may be appraised and checked to see if they

are suitable for inclusion in the state-wide series.

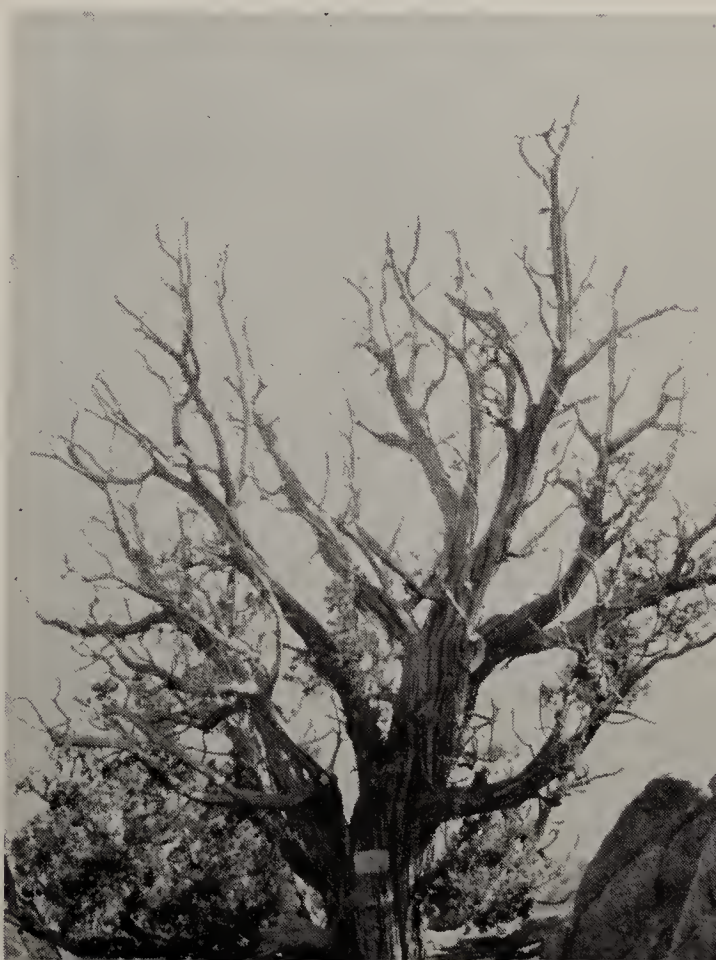
We hope that this will be just the start, and that before many months we may have many similar areas of outstanding botanical interest set aside for the benefit of Colorado's citizens, her visitors, and future generations.



In Henderson's "Handbook of Plants", published in 1881, the author writes, "It was Downing, we believe, who laid down the common-sense rule, that in the laying out of walks or drives in the garden or pleasure-ground, there 'never should be any deviation from a straight line unless from some real or apparent cause'. So, if curved lines are desired, trees, rocks, buildings, or mounds must be placed at the bend or curve, as a reason for going round such obstacles."

ALICE WOOD.

One of the 900-year-old Junipers in the Garden of the Gods



Industrial Landscaping

By MAURICE N. MARSHALL

THERE has been a rather recent awakening by leaders of industry to the importance of industrial landscaping as a factor in good community relations and as a general morale builder for the employees.

A recent survey among eastern industrial concerns brought out the astonishing fact that in their opinion industrial landscaping ranks right up with good factory and office housekeeping in importance. This same survey also revealed the fact that most factory executives are keenly aware of what their competitors are doing along this line, which means that the present trend toward industrial landscaping is very apt to continue.

At present, this trend is most noticeable in the industrial centers of the eastern half of the United States where the outstanding examples of extensive landscaping are to be found. But the trend

is reaching westward, with some good examples in the Denver area.

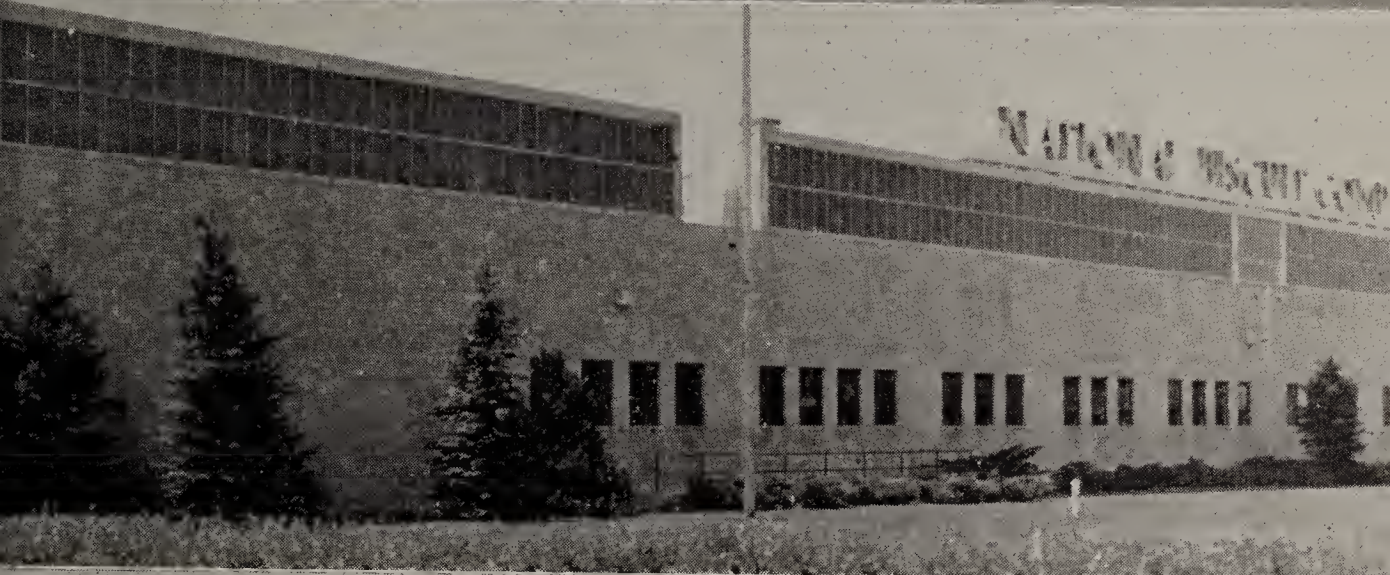
Today, because of the ever widening realization of the importance of landscaping, most new industrial establishments are designed to include attractive grounds. Also, most old factories are being renovated and improved so as to include lawns, trees, shrubs and flowers.

Everyone interested in the beauty created by the artistic and proper use of trees and plants is pleased to note this trend. It reflects a progressive attitude on the part of management and adds beauty to the community as well as value to their property. It brings with it a higher appreciation on the part of the employees of the necessity of orderliness and cleanliness inside the plant. It appeals to the sense of pride of employees and management alike. They become proud of their work, their plant, and their product.

Opposite page, top to bottom—Well landscaped industrial plants. Robbins Incubator Co., Denver; National Biscuit Co., Denver; Brown Lumber Co., Lamar, Colo.; Heckethorn Manufacturing Co., Littleton, Colo.

Below—Excellent treatment of otherwise ugly space on Main Street, Florence, Colo.





TWO ACRES FOR YOUR LIFE

BY MILTON S. EISENHOWER

Condensed and reprinted from Collier's Magazine by permission of Collier's and the author.

SOMEWHERE in the world there are two acres of land that are keeping you alive. They may be fine fertile, productive acres or they may be skimpy, eroded acres, but whatever they are, they're yours. And they're all you'll ever have. Two for you, two for me.

Only 11 per cent of the world's land can be used for food production—a total of 4,000,000,000 acres. The world has 2,000,000,000 inhabitants, hence the two acres per person. It is not enough. Before the war two thirds of the world's people didn't get enough to eat. Today more than two thirds don't. The reason is simple: Today people don't know how to produce enough food to fill their own stomachs.

As things now stand, they're not learning how, either. Your two acres are not producing more food and fiber for you each year; they're producing less. All over the world men are fighting hard to make their acres produce more. Their weapons are scientific developments to provide better crop varieties, better production methods, better machines. But working against them are powerful destructive forces—accelerated erosion, depletion of soil fertility, man's ignorance and neglect. Slowly, but with an awful certainty, the destructive forces are winning.

Originally your two acres—and everyone else's—had an average of about seven inches of topsoil. Those seven inches were all that stood between you and starvation. They still are—only in too many places on the earth the seven inches have been reduced by erosion and neglect to five or three or zero. Extend the zero area to all the productive acres of the earth and man would die. The zero areas are being extended.

It took Nature several hundred years to build each inch of that top soil. Man and Nature have been destroying it

recklessly. Three-fourths of the world's productive acres are subject to erosion, and all to fertility loss. Meanwhile the world's population is increasing: It has gone up half a billion in the last forty years. So pretty soon you won't have two full acres. A dramatic description of what happens when land is abused is contained in David E. Lilienthal's book T.V.A.: Democracy on the March:

"The 'played-out' farm lands of the South, now in the process of rebuilding, were 'mined' to grow a single crop of cotton: they are one more illustration of the remorseless arithmetic of Nature. Here once-lovely manor houses stand seedy and deserted because their foundation, the soil, has been exhausted, romantic monuments to a national tragedy of waste. And the great towers of Manhattan and Chicago, the modern business streets of Omaha on the prairies, all rest on the same foundations as the old plantation manor—the land, the waters, the minerals and the forests. We are all in this together, cities and countryside".

We have more than two acres of productive land per person in the United States, of course. That is why hungry people everywhere look to us for part of their food. But for how long may they do so? Even in the United States, the forces of destruction are winning. We began with the richest resources on earth and have produced more abundantly than any other country. We have also destroyed our resources with greater abandon than any other people.

Since our forefathers first began conquering America, more than 280,000,000 acres of crop and grazing land have been destroyed or impoverished by reckless use. Two and a half times that many acres have been damaged.

Croplands have, of course, suffered most. About 100,000,000 acres of once good cropland have been essentially

ruined for further production, another 100,000,000 acres have been badly damaged, and still another 100,000,000 acres are eroding.

As you fly over the United States, you can see the results of generations of wasteful land use in the colors of the fields. You see the sickly yellows and pale browns of eroded, bare soil cutting into the lush green of fields that still support growth. You see ghastly red and brown gullies, their walls caving in, some of them in the exact pattern of great river systems.

Fly over the Western Great Plains: Here is the vast area that saw the buffalo give way to the cattle herds up from Texas, the enormous operations of the great cattle companies of the seventies and eighties, and the closing of the range by the barbed wire of the homesteaders. You see below you a farm in western North Dakota where the homesteader tried to produce corn and general crops. His son shifted to wheat, for that promised more profit. He kept this up until drought, dust storms from the angry land, and low prices drove him west. Then, just as World War II began, the rains came. A new, hopeful settler arrived to take a try at wheat and corn.

The habits we developed in pioneer days still persist. Indeed, the greatest waste has occurred during the last fifty years. Since the turn of the century a fourth of the cultivated land in Nebraska, Kansas, and Oklahoma has already been essentially ruined, and more than that has been severely damaged.

During World War I, the physical frontier disappeared. There was no more new land to move to. Logically, our attitude toward basic resources should have changed then, but it didn't. Stirred by the slogan, "Plow to the fence for national defense," farmers produced to capacity, regardless of consequences. They plowed up the grasslands of the plains and reaped disastrous dust storms. They plowed up and down the hills all over America and loaded the streams

of the nation with millions of tons of topsoil.

During World War II, our soil experienced new indignities. War demands caused overuse nearly everywhere. Fields that should have been left to lie fallow were continuously planted. Sound rotations of crops was forgotten. Thirty million acres suited best to hay and pasture were brought into cultivation. Fertility losses doubled in some areas.

Erosion of the land injures more than agriculture. It damages highways and railways, silts up costly reservoirs and navigable streams, and causes more frequent floods to roar across our cities and lowlands. The annual damage by erosion in the United States is nearly \$4,000,000,000.

Seventeen years ago, agricultural experts, led by Hugh Bennett, pointed out to Congress that production science can not provide the benefits it should unless it is matched with good land management by the farmer himself. If the farmer would plow around the hill, instead of up and down it, they said, if he would use strip cropping, terraces, soil-building rotations, and other practices where needed, then scientific discoveries of the past three quarters of a century could bring great benefits to all the people.

Congress responded. The federal government and the land-grant colleges immediately initiated research to discover how to prevent soil loss.

They made some startling discoveries. Of the 1,000,000,000 acres of farm and range land in the United States, only 70,000,000 can be safely cultivated without some precautions. More than 400,000,000 acres can be cultivated safely only if proper conservation practices—contouring, strip cropping, terracing—are applied. Most of the remainder is suitable mainly for grass and trees, and much of this needs reseeding, liming, fertilizing, and controlled grazing.

The multitude of public farm aids we have today should be co-ordinated locally by the soil-conservation district, for that

agency is managed by the farmers themselves. The framework of such coordination should be a specific farm plan which, when completely adopted, will result in highest possible production *consistent with soil conservation*. Each local district should insist upon this co-ordination. It should yell loud and long before federal and state legislators and administrators until the job is done. And every piece of federal and state agricultural legislation should be so amended as to make this type of local co-ordination possible.

Even if every public agricultural agency and every farmer works toward this common goal, we shall succeed none too soon. We haven't too much good

land left. We haven't enough left if we think, as we must today, of the oneness of the world. Our American acres must be saved, not only that you and I may eat well from our two acres now and in the future, but also that we may ship surpluses to lands now hungry.

Scientific practices applied to all the lands of the world would provide just about enough food for a moderately good diet for everyone. But no more than that. As things stand now every man's two acres are producing less and less while more and more men arrive in the world to eat from them. There are very few things among the concerns of men which are more important than that single fact.



The Gothic Botanical Trip

SIXTEEN people spent the full 8 days on our second botanical collection trip. Five people came over to spend July Fourth with us. Dr. and Mrs. Shubert with 12 of their students in botany from Denver University, Mrs. Anna Timm who supervised the cooking and George W. Kelly comprised the main party. Denver University furnished a large bus which accommodated all the passengers, their equipment and food.

The party left Denver early the morning of June 28 and returned July 6. The first regular camp was on the shores of beautiful Lake Irwin near Kebler Pass, and the last few nights were spent under the trees near Gothic. Snow still covered much of the ground above 10,000 feet elevation so little could be done with the alpine flowers, as was originally planned. We found the flowers at lower elevations in excellent shape, and several hundred species were collected and pressed.

This region has not been thoroughly

botanized so many species were collected which were not listed in the Colorado botanies.

Dr. John Johnson, director of the Biological Laboratory at Gothic, was most cooperative and helpful. We were all invited to their party the evening of the Fourth, making the largest crowd to assemble in the old town of Gothic since 1884.

The weather man was also cooperative, furnishing a full moon most of the time and producing only one real rain. Most of the party slept in army pup tents. Two expeditions were taken across country by a small party of hardy hikers. The backpack trip over Swampy Pass will be long remembered by these people.

A few days after the trip Dr. Shubert brought his class down to Horticulture House and spent the day identifying and mounting the specimens collected. For many years to come the Association will benefit from the material collected on this trip.

George W. Kelly.

Opposite page, top to bottom—Some of the boys hiking up Poverty Gulch towards the old town of Pittsburgh; The camp above Gothic; Part of the old town of Gothic.



A Dream Come True

From "The Denver Post," Sunday, July 20, 1947.

"'Horticulture House,' headquarters for Colorado's 'Green Thumb' enthusiasts, was officially opened July 11th with a reception for Mr. and Mrs. John Evans, donors of the house, and all donors to the house, library and grounds. The house and grounds were purchased by Mr. and Mrs. Evans for the use, without charge, of the Colorado Forestry and Horticulture Association."

On that day, as I sat in that attractive living room I heard that expression over and over again, "A dream come true," and my thoughts went back to the beginning of the Garden Club of Denver. In the spring of 1916 Mrs. J. F. Welborn asked a few garden loving friends in to discuss "garden affairs" and form a study group for the winter. From that beginning the club is now thirty-one years old and flourishing, with thirty-four working members. The next year that small group joined the Denver Society of Ornamental Horticulture and that fall under the direction of Mrs. Henry Sewall took charge of the tea at their Flower Show at the Auditorium. Out of \$40.00 profits we gave them \$25.00.

The fact of our joining the Denver Society of Horticulture was an incentive to "practice what you preach," and in 1918 Mrs. S. B. Walker, a wild flower specialist, was consulted, and at her suggestion a place of two acres on Genesee Mountain was selected and later fenced. Three hundred dollars was collected from members, and seeds of columbine and red lilies were planted. It was thrilling but impractical, and later given up. Mrs. Walker died, the place needed much care and at that time the Garden Club didn't care to employ a caretaker.

Perhaps it was the "seed" of a future Arboretum. We hope so.

The DSOH had flower shows up to 1923, and we took charge of the "Teas." In 1920 the Auditorium was not available so there was no Flower Show. However, on May 10, 1920, they erected a tablet to the "memory of John Berry, Colorado Pioneer Horticulturist," in Washington Park and two small oaks were planted at the stone by our Garden Club. By 1920 the Garden Club of Denver, then four years old, became a member of the Garden Club of America, enjoying all its rights and privileges since that time.

The Denver Society of Ornamental Horticulture has been, and always will be, close to those who ask its help. Mr. Kelly has often spoken to our club, giving us practical help from his knowledge and years of experience. Mrs. Evans has been a member of the Garden Club of Denver since 1916, and we are more than proud of her achievement in giving Denver a chance to further and sustain the great work, "Horticulture House," which their support will be able to do.

The project our club has in hand is the garden between the Teller House and the Opera House in Central City under the direction of Mrs. Marriage who supervised the planting at Horticulture House. We are in constant touch with that organization.

Go down to 1355 Bannock Street and see for yourself what vision, work, taste and a firm belief in the future of horticulture in Denver has been made possible to every one. Three thousand members are needed to sustain this great venture. If each member asks a friend to become one too, the task will be simple.

AMELIA R. FIELD (Mrs. Theron R. Field)
Historian of the Garden Club of Denver.

Giants In The Earth

A sympathetic glimpse into the prodigiously busy life of the plain ordinary earthworm, true friend of man.

By JUEL F. ALSTAD

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PERHAPS no creature is more worthy of our respect and veneration than the earthworm, for in the whole mass of earth there's not a granule of fertility, not one crumb of seed-sprouting nurture, that hasn't been compounded and enriched by percolating through the long alembic of its body.

The earthworm is an underground test tube in which potash, calcium, magnesium, nitrates, phosphates, and other solid chemicals are assayed and broken down into easy portions for the tender appetites of seedlings; acids and alkalies are blended into suave neutrality, and the whole mass of earth is gently churned into rich and fragrant humus and deposited in little mounds—called castings—upon the surface of the earth. In one year one worm produces about eight pounds of castings in which plant-growth elements are from three to eleven times more abundant than in the top six inches of soil. So exhausted earth, worn with the monotonous demands of greedy crops, revives under the tonic of the worm's ministrations to feed succeeding generations.

Its life is not, therefore, merely a stretch of extended indolence. A live worm, like a live wire, is a source of power. Slowly this patient digger tunnels through the soil, pushing aside the loose lumps and eating its way through closer packed particles to depths varying from five to twelve feet. By this channeling it excavates the world's basement, brings up the nutrients buried in the lower strata, and distributes them within reach of the hungry roots of plants. It circulates the soil bacteria which stimulate the upward struggle of timid plantlets; it plows, harrows, and cultivates the earth, drills air passages so that

roots may breathe, and sinks reservoirs which store moisture long after the upper surface is dried out. Thus this little giant overturns the earth and so succeeds in doing what Archimedes only dreamed of.

It is estimated that an acre of average garden soil contains from 25,000 to one and one-half million earthworms, and that these churn and enrich from seven to eighteen tons of soil a year. To a gardener, therefore, an acre of worms is worth ten tons of organic fertilizer a year plus the continuous efforts of three skilled laborers each working an eight-hour shift every day. And worms demand no salary, no overtime pay, and no bonuses, never go on strike, and take no vacations.

Though all earthworms may seem as much alike as—well, what could be more alike than worms?—yet there are more than 1,000 species. However, scientists have grafted one species upon another to produce several distinct new types: long, thin emotional wrigglers with sleek red necks and an inherent restlessness for working garden soil; thick, meaty worms predestined for fish hatcheries, chicken coops, and birdhouses; and short, fat, oleaginous specimens which are pressed into the service of medicine for these are squeezed to make the modern "snake oil," a penetrating fluid advertised as an anodyne for earache and rheumatism.

The earthworm is a regular stick-in-the-mud without the least trace of wanderlust. Nevertheless it may travel on the roots of plants exported into distant countries. But the world is its apple: it is equally at home in the Tropics and in regions of subzero cold. And once introduced into foreign lands, it digs in

to stay, often supplanting the native species which retreat farther inland in their efforts to avoid these foreign entanglements.

In its domestic life it is unapproachable—it lives alone and likes it. All day it hangs in its solitary burrow, clinging to the slippery walls by its setae—short rods or bristles projecting from tiny openings spaced around its body—for thought it has no eyes, it avoids the light. Sensitive cells strung along the surface layer of its skin respond to light intensities and indicate the source of the illumination. Its perception is so keen that it feels the modulating tones of day light and can tell when dusk deepens and darkness covers the earth.

Then, shielded by night, it stretches forth in search of victuals. With its tail spread flat within the threshold of its tunnel to snap back the long elastic body like a rubber band at the least touch of danger, it pivots and sways back and forth and, extending its muzzle to explore the grasses, it puckers its pointed lips like a connoisseur of rare wines as it sips night's nectars.

Almost anything furnishes it sustenance: fallen leaves, decayed roots, and other vegetation; bits of wood, scraps of meat disdained by the overfed house dog, and crumbs fallen from the overloaded banquet boughs of birds. These titbits it sucks up, smacking its lips with little kissing sounds like the hissing slur-r-p of a leaky tap in the quiet night. Human senses are not aroused by such delicate kissings, however, for these gustatory smacks are supersonic and so audible only to the finer perception of inferior creatures.

At night, too, it meets its fellows extruded from their tubes and often joins with one of these in the rites of reproduction. The distinction of sex is wholly superfluous to the worm for, endowed with a double entendre appropriate to such efficient creatures, each is both male and female. It discharges its fertilizing juices from sacs located on its under surface and pours them into the other's

spermathecae—receptive wells near the anterior tip—and at the same time receives its mate's reciprocal contributions.

When the first sharp blades of sunlight begin to cut through the loam of night, the worm reels in its sinuous length and descends again to its snugger. There, inhumed against the vulgar pecking of bird rabble and the jostlings and confusion of day, it nibbles the morsels it has retracted for lunch. Sometimes it may draw down a seed which, thus embedded in the creamy soil, sprouts into a tree. So the worm not only prepares the earth, but also perpetuates its vegetation.

In a week or ten days its eggs are ready for delivery. At this time it loosens its belt—a secretion of the clitellum, the yellowish band encircling it near the middle—and slides it headward.

As the belt oozes past, the worm discharges into it, from tiny openings behind the spermathecae, its load of eggs—usually from two to five—which, on gliding over these sperm reservoirs, become fertilized. The exuded girdle hardens in the air to form a neat pouch—the capsule—which the worm plants in the warm bosom of a compost pile or in the topsoil to incubate. The earthworm's reproductive mechanism is, therefore, somewhat like modern packaging machinery in which a carton, placed on a conveyor belt, is automatically filled, sealed, and packed away.

Three or four weeks later from three to as many as 20 tiny, agile, white threads begin to writhe out of each egg—little waving hairlike wormlets that go off immediately with a convulsive wriggle to make their own way through the world. A young worm matures rapidly, increasing its stature horizontally by adding new segments to its body. The passing seasons leave their mark upon the earthworm: it grows ringed with age, time-tallied like a tree. And in three months the wormlet is a fully matured adult, though it may continue to

lengthen. The common European and American earthworm reaches an average length of four or five inches, but some of its tropical relatives may span a tip-to-tip distance of six or seven feet!

And when it shuffles off its mortal coil, its body decomposes into compounds of nitrogen, the element first exhausted from the soil by plant respiration. Alive or dead, therefore, the earthworm is a

strip of utility, a boon to gardeners, and sustenance to hungry fowl and fishes. Since it confers so many rich blessings on mankind, we can hang upon our garden gates no more appropriate motto than the appreciative words of Cowper:

The man who needlessly sets foot
upon a worm,
I would not enter on my list of
friends . . .

A Small Town Talks

Other Towns might well listen.

The Following Editorial Appeared in the May 23rd Issue of "The Littleton Independent"

ONE-THIRD OF ONE PER CENT FOR BEAUTY

ANYONE who has traveled through the suburbs of Eastern cities knows that some communities have charm while others look drab and uninviting.

Littleton could easily become known as the most attractive town in the state if we spent just a fraction of one per cent of our annual budget toward this end. We already have the river, a view of the snow-capped Rockies, a main street with a vista at each end, and verdant farm lands all about us. But we have not given the town those little touches which make outsiders' faces light up when they hear the name of Littleton.

It is nobody's job to think about the town's beautification. Most of us are so concerned about curbs and gutters, sewage, schools, and a water supply that any ideas we may have about improving the town's appearance lack the steam for carrying them out.

We propose that a few people be shouldered with this responsibility, say a park commission of five citizens, one being the chairman of the park committee of the town board. Such a commission should be empowered to retain a graduate landscape architect to advise it on design, planting, and horticultural care. Landscape architects were strangers in this area until recent years, but they have demonstrated what they could do for the orderly growth of Arapahoe county, for the zoning of Littleton, for

the improvement of the Littleton cemetery, and for the laying out of a modern village, such as Bow-Mar. We must now apply the talents of one of them toward our park system. This includes the Rio Grande park, Sterne park, the library grounds, the North Prince avenue, Rapp avenue and Bowles avenue entrances to Littleton, and the court house lawn.

As the court house yard is under jurisdiction of the county, the commissioners will no doubt lend a hand in securing the services of a landscape architect. After the landscape man makes his initial drawings, it probably would not be necessary for him to return to Littleton more than once or twice a year, as he could settle most questions by telephone. One of the chief functions of the park commission should be the submission of a written report to the town board each year. This will give continuity to the beautification efforts. Now, when a trained eye sees any of our parks or the yards around public buildings, the reaction is always this: "Why spend such a lot of money and effort and not achieve some beauty?"

We are not advocating more public expenditure. If just one-third of one per cent of our present budget were taken away from what we are now doing and used in obtaining advice, Littleton would become famous.

Ignorance In Leaf Burning

By BRUCE HUTCHISON,

in the Winnipeg, Ont., Free Press

FOR Christopher Morley I have always held a special sort of reverence as the man who "blows from the slippery suds of life his bubbles of fragile glee," and yet in his spare time has laid down many solid bricks of art with a talent as many-sided and opaque as a well-cut prism. A prism, yes, of many gleaming facets, but with a flaw. Alas, I find Morley is a leaf burner.

When most men approach the autumn chore of raking leaves it is a dull labor, usually postponed until the leaves are moist and heavy, all the crisp spirit soaked out of them, all the magic sodden in decay. As one would expect of such a joyous, bouncing spirit, Morley rakes his leaves not only with sheer physical pleasure but with a philosopher's understanding of this autumn rite:

That is what I like about raking
leaves—

It is wine and opiate for the mind:
The incessant skirmish of the wits
is calmed,

And as you rake and burn
And dodge, with smarting eyes
The pungent, veering reek,
You fall into a dull easy muse
And think to yourself,
After all, what is writing
Books but raking leaves?

This is charming rhyme and rankest heresy. For by his own confession, this poet who deeply understands and passionately worships nature commits the great autumnal crime against her—he burns the leaves. How many millions of North Americans have burned with him this autumn, and how many billion innocent leaves?

Food for Plants.

The most illiterate gardener, learned in matters more important than letters, knows that leaves piled up in autumn,

packed down by winter snow and distilled by summer sun, make an unequalled food for plants of every sort.

Why, if Morley were here today I could show him a poem written in oak leaves, a very saga of heaped-up compost—nay, a history in sublimest form, layer on layer to mark the passing years of my gathering, each layer heavy with recollection, and now all acrumble in the rich fibrous stuff of growth. All this, in due time, when it is mellowed like old wine, will be poured gently on my garden. Morley's plants will be fed on printed verse. Robust and spicy as that verse will be, it is food for men, not plants. My plants, I warrant, will thrive better.

Loss to the Planet.

But, of course, the chemistry of this process is the least part of it. A man may rob the soil every autumn, he may abduct and burn the tree's fluttering children, the posterity on which its life depends, but he can replace it, perhaps, by importing new earth and spreading expensive chemicals, though with a net loss to the productivity of this planet. I do not wish to press the charge of wantonness and theft too far. The real indictment of the leaf burner is something deeper, and when I come to consider this I must confess I am disappointed in Morley. Ignorant men may not understand this matter, but a poet of subtle and parabolic insight should know better.

Once the thing is explained to him, I am confident Morley will write another poem to elucidate it, for prose will not serve. I can only outline this matter in the rough and hope that some day, in better hands, poetry can give it voice.

Processes of Nature.

The point, then, which Morley's poem approaches but does not quite grasp, is

that the man of nature must always, for his own inward health, submit himself to the processes of nature. His life is a constant surrender to a higher law which he cannot hope to understand.

How well Morley knows this is proved a thousand times in verse, of a lusty, earthy smell like the deep brown smell of autumn itself; but what he fails to see, what all the tribe of leaf burners fails to see, is that the law demands the preservation of the leaves and forbids their destruction, save by nature's own slow method.

Burning is for wood and witches. Applied to leaves, it is a crime against the gods of Morley's own worship, a high crime and unnatural, a slaughter of innocents.

Leaves Should Be Raked.

All men should rake leaves, as Morley says, and hear the peculiar music of them, that swish and sweep which exactly

duplicates the sounds of gentle waves on a sandy shore.

All men should recapture one of youth's highest moments, the feeling of dry and cracking leaves underfoot, most precious because it foretells the end of summer.

But, for a brief delight of scented smoke and leaping flame, a man surrenders the true satisfaction of leaves when he burns them, the pleasure of seeing them turn month by month to loamy richness, the reward of their fertility in his garden but, above all, the knowledge that he is living within the law, that he deserves the physical bounty of nature and its abiding presence in his spirit, its intimations of immortality all through the barren winter, because he has earned them.

How depressing to think, therefore, that smoke is rising from backyards all over America today, how very sad to hear that a man who understands all other facts of nature is burning leaves in ignorance and rhyme.

Horticulture

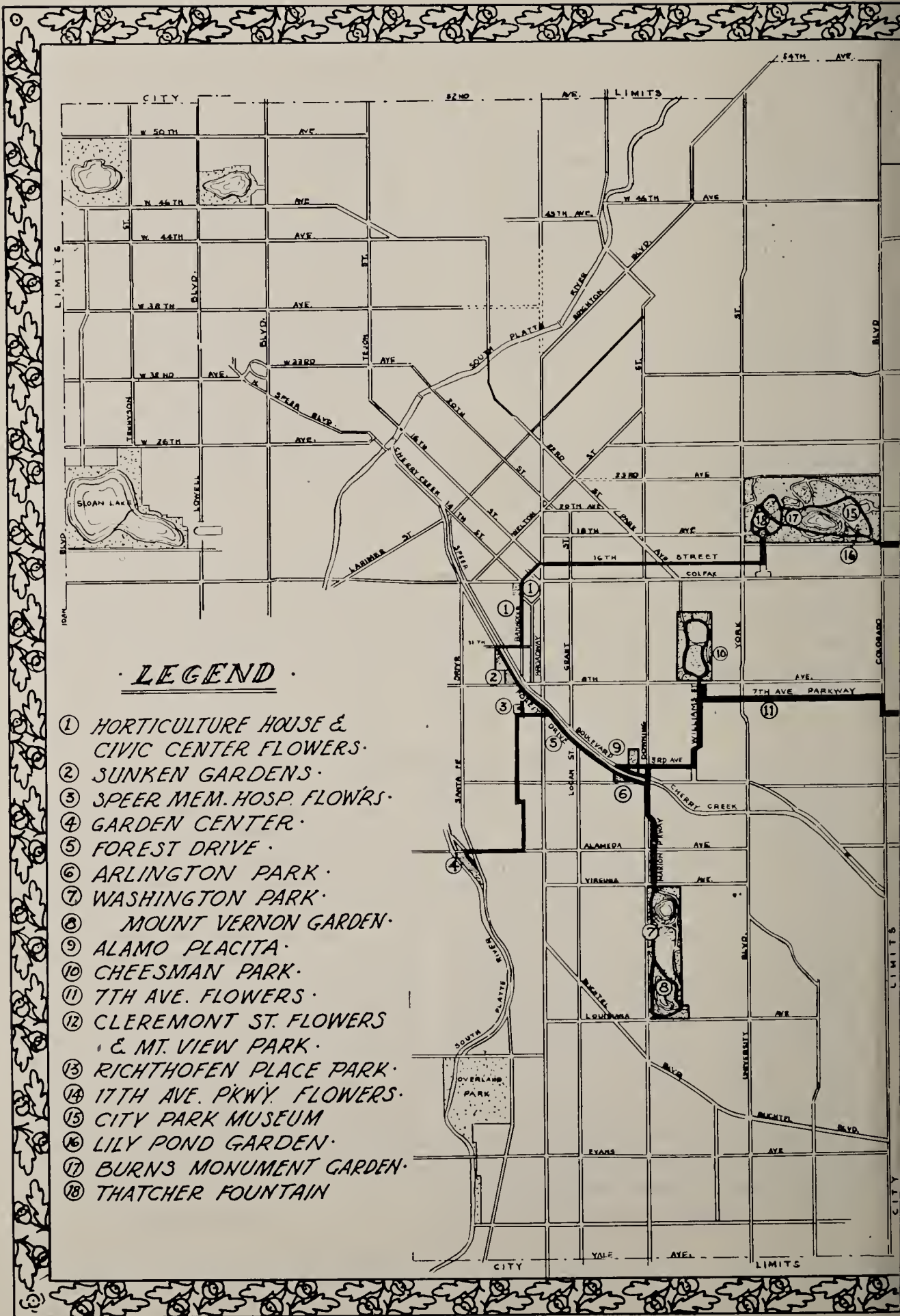
"It may be useful to reexamine the meaning of the word 'horticulture.' A number of rather different activities are called horticulture. In some parts of the world, the growing of vegetables especially is called horticulture, in other parts vegetable growing is considered something belonging to agriculture rather than horticulture. The same can be said of pomology. With ornamental horticulture there is less doubt.

The word horticulture, however is also being used in a wider sense. A broader concept of horticulture is gaining its way all over the world. The efforts of groups to which I have recently referred, are nothing but symptoms which we find

in some form or another all over the world, symptoms of a feeling that there should and could be a stronger band and link between those who grow plants, who play with plants and even those who make the rules of those activities and who are responsible for the conservation and development of natural resources as far as they concern plant life.

This feeling, this wide new concept, truly worldwide, as ill-defined as it still is in its immediate objects, may well become something of great international value, both in horticultural science and practice in human relations generally."

DR. FRANS VERDOORN,
Waltham, Mass.



Denver Parks Flower Trail

THE Denver Park Department has many places where the summer flowers are unusually attractive. On the accompanying map a route has been suggested which we have called the Denver Parks Flower Trail. By following this route, one can observe the most interesting flower displays of the city.

The Trail begins at *Horticulture House* (1355 Bannock St.), and ends at the same place. The following gardens are of interest. Unusual varieties for 1947 are:

1. Civic Center:

Beds on Bannock and 14th Avenue—Draceanas, Begonia Carmen, Lantana M. Schmidt, Geranium Salmon Ideal, Snapdragon, Amber Gem, Dwarf Blue Ageratum, Verbena Venosa, Centaurea candidissima, Giant mixed Zinnia, Centaurea gymnocarpa.

Beds on Bannock and Colfax—Mixed Verbena and White Alyssum, Salvia with Centaurea gymnocarpa. The circles are filled with Draceana, Salmon Ideal Geraniums and white Alyssum.

In front of City Building—American Beauty Geraniums with White Geraniums.

2. Sunken Gardens:

Between 8th and 11th Aves. on west side of Cherry Creek.

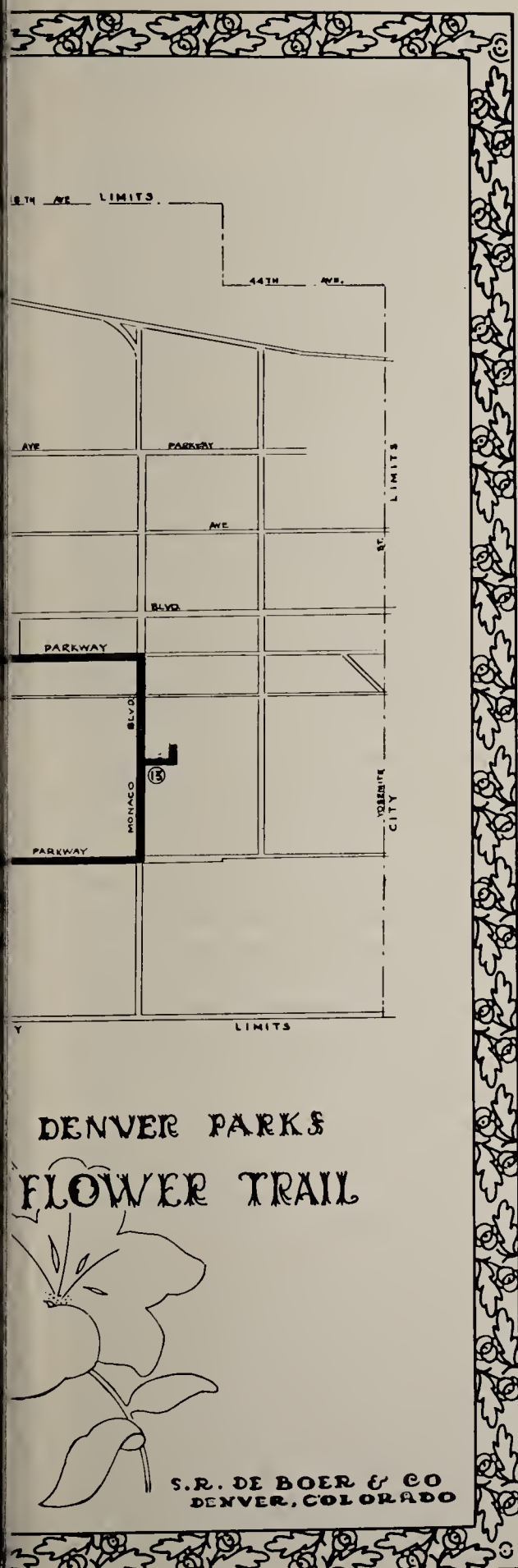
In cross—Geranium Mme. Landry.

Small circles — Intermediate White Snapdragon.

Beds at foot of cross — Snapdragon Orange King and Snapdragon Carmen. Verbena venosa and mixed Verbenas bordered with dwarf Marigolds.

The irregular beds are bordered with White and Lilac Alyssums and Coleus Maria and Green and White.

The beds are filled with colorful patches of Marigold Robert Biest, Candytuft, California Pinks, Gomphrena, Weeping Lantana, Zinnia Lilliput, Statice, yellow Cosmos, tall orange Mari-



golds, *Petunia General Dodds*, *Larkspur*, *Nicotiana sylvestris*, *Petunia Steel Blue*, *Calendula*, annual *Chrysanthemum*, various pink *Petunias*, (*Celestial Rose*, *Glow*, *Rosy Morn*, *Cheerful*, and *Pale Amaranth Pink*), *Coleus Green Goddess*, *Cleome Pink Queen*, *Nierembergia Hippomanica* and *Purple Robe*, *Dimorphotheca*, *Fuchsia*, *Coleus Maria*, pink *Ageratum*, blue *Ageratum*, purple *Stocks* (*Elk's Pride*), mixed annual *Gaillardia*, *Nepeta* and *Red Valerian*.

South of the pool, look for rose beds and flowering Pagoda trees.

On Creek bank—*Geranium Rickard* with white *Alyssum* and *King Humbert Cannas*.

3. *Speer Memorial Hospital*

On Bannock near 6th: *Geranium Better Times*, *Coleus Green* and *White* and *Coleus Verschaffelti*.

4. *Garden Center:*

Alameda and Kalamath: Here there are 14 different annual beds, following the long line of the pool south of the building. The beds contain various kinds and colors, red *Snaps*, bordered with white ones, *Cuphea*, or *Cigarette Plant*, bordered with white *Alyssum*, *Heliotrope* and white *Begonia*, to name a few. Around these beds is a wide perennial border which has *Coreopsis* and *Phlox* producing prominent colors.

5. *Forest Drive:*

On south side of Cherry Creek: The trail continues through the forest of Pines and Blue Spruce (*Koster*).

6. *Arlington Park and Marion Street Parkway:*

(South of Cherry Creek and west of Marion Street): The park has Haws and Hopa apples. *Floribunda Crabs* are planted on Marion Street Parkway. Just north of Alameda Avenue the center parkway shows *Rosa Setigera* and *Rosa rugosa Grootendorst*.

7. *Washington Park Perennial Garden:*

Going into Washington Park by a bed of mixed *zinnias* giant, bordered with *Zinnia Lilliput*.

The Perennial Gardens in this park afford the biggest riot of color to be seen in the Denver Parks Flower Trail. There is a great variety of flowers, both annual and perennial and colors, usually in large quantities — yellow perennial *Coreopsis*, annual *Chrysanthemum*, purple *Petunias* bordered with light pink ones, either *Pale Amaranth Pink*, or *Cheerful*, *Geranium Better Times*, *Carnation Napoleon*, *Coleus Green Goddess* bordering seedling *Dahlias*, two varieties of *Heliotrope*, *Nierembergia Purple Robe* bordering a bed with purple *Statice*, and mixed *Snapdragons* filling in around *Peony* plants, a showy bed of *Geranium Salmon Ideal* with *Draceanas* bordered with white *Alyssum*, an interesting combination of tall *Iceland Poppies*, with *Violas* under them, *Pink Larkspur* with *Dahlias*, bordered by *Nierembergia Hippomanica*, (the lighter colored *Nierembergia*).

There is a big bed of *Sedum Spectabilis*, and a bright bed of intermediate snaps in solid patches of yellow, maroon, purple, orange and white. *Dianthus deltoides*, a perennial, small and bright pink, covers a patch of garden and perennial *Chrysanthemums* are beginning to bloom nearby.

All this was up near the north end; in the middle of the area there are beds of mixed *Verbenas*, bordered by dwarf red *Verbenas*, *Petunia Velvet Ball*, bordered by *Petunia Pale Amaranth Pink* and *Coleus Green* and *White*. *Geranium Mme. Landry* is bordered by *Petunia Sulphur Yellow*, nearby and at the south end, there are beds of *Vinca rosea*, *California Pinks*, *Geum Mrs. Bradshaw* (A perennial), *Pentstemon Sensation* (also a perennial, but very tender), *Alaska Daisies* (Perennial) *Scabiosa* (the perennial), *Gaillardia* (perennial), *Foxglove*, *Campanula*, and many other varieties.

8. Mount Vernon Garden:

Look for such old fashioned flowers as hybrid Nicotiana, Heliotrope, mixed Vinca, mixed asters, Amaranthus, lavender Stocks and Helichrysum.

9. Alamo Placita (at Ogden on 3rd):

In the beds near the playground notice the President Ganna and the bright pink Geranium Mme. Landry. Across the street the Verbena venosa around the four corner Silver Cedars is beginning to make a show of purple, along with the beds of mixed Snaps.

10. Cheesman Park (8th and Williams):

At the south end of the Memorial there is a beautiful bed of Talisman roses and below it Better Times Geraniums with standard tree Buddleias spotted in the beds. Elsewhere around the Memorial are beds of Teplitz roses, Petunia Glow and mixed Snaps.

11. 7th Avenue (between Williams and Colorado Blvd.):

There are many bright beds along this avenue, especially those between Vine and Gaylord, at York, between Josephine and Columbine, with Pink Geraniums, mixed Verbenas, Verbena venosa and mixed beds between Fillmore and Milwaukee, with Canna President, Phlox Eclairer, seedling Dahlias, bordered with Coleus. On Jackson, a large planting of Snaps, yellow, purple, pink and orange, is now beginning to show.

12. Clermont Street and Mountain View Park:

On the center parkway on Clermont Street between 3rd and 4th Avenues, the whole block is designed with big, very bright and showy flower beds. There is a bright patch of Petunia Glow, 30 feet square, and a smaller one of purple Petunias. There are long beds of Begonia Carmen, bordered with white Alyssum and Nierembergia Hippomanica, alternated, and Red Calvia and Sulphur Yellow Petunia, bordered with Pyrethrum aureum. There is a long drop shaped

bed of lemon yellow marigolds, bordered with Centaurea gymnocarpa. The outer bordering planting all around the block is of various perennials, the Iceland Poppies and Sweet William being most prominent and now beginning to fade.

13. Richtofen Place at Monaco**14. 17th Avenue**

(From Monaco Parkway to Colorado Boulevard).

15. Museum of Natural History (City Park) on the west side:

There are Petunia Velvet Ball and Cheerful, Begonia Carmen, Verbenas, dwarf single Dahlias, Calvia Firebrand, giant Zinnias, tropical Water Lilies in main pool, water Hyacinths in small pools.

16. Small Lily Pond (City Park):

Notice Petunias varieties Glow, Diener's Blue, General Dodds; also big masses of other flowers.

17. At Burn's Monument (City Park):

Where is found the largest group of annuals in this park, there are many small beds with a large variety of flowers: Snapdragons Cloth of Gold, Apricot and Purple King, lilac Alyssum with blue Lobelia, California Pinks with Grevillea specimens, Verbena venosa with Centaurea candidissima, Petunia Cheerful with Pyrethrum aureum, dark Marigold Robert Biest, with white Alyssum, dwarf single Dahlias with Phrythrum aureum, dwarf red Verbena (Venus) with yellow Snaps, Heliotrope Crown Hill and Gomphrena, pink Petunia Glow and White Cloud, with golden Bedder Coleus, Cuphea, Mixed Snaps, white Marguerites, with dwarf Rosie Snaps, yellow Supreme Marigold and Verbena venosa, Amber Gem Snaps and many other varieties.

18. At Thatcher Fountain (City Park):

Look for Begonia Carmen, white Marguerites with Salvia, tall yellow Supreme and orange Marigold and others.

S. R. DEBOER.

Plant Diseases, Their Causes and Prevention

By W. A. KREUTZER,

Formerly of Colorado A. & M. College

THE importance of plant diseases need not be stressed for the plant lover, nurseryman, or garden enthusiast. Diseases of one sort or another are responsible for huge losses annually. Many of the diseases which distort or destroy your plants are preventable. In order to control diseases we must know something of their causes, we must be able to recognize a disease and we must know what to do to prevent diseases and their spread. The following outline merely constitutes a rough picture of the situation. However, it should prove helpful to growers of plants. 1. *The causes of plant diseases.* Plant diseases are caused by living things such as *bacteria*, *fungi* (molds), *insects*, and *nematodes* (eelworms); and by non-living things such as *viruses*, and *environmental agencies* (mineral salts, toxic gases, alkaline soil, etc.). For a more complete understanding of these causes of disease they are described as follows:

(a) *Bacteria.* Microscopic organisms composed of single rods or spheres which live in the soil and in diseased plant parts. Plant disease-producing bacteria enter plants principally through wounds and natural openings (stomata in leaves for example). Bacteria cause rots, wilts, and leaf spots. To prevent bacterial diseases (1) disinfect pruning tools as they are used; (2) use seed from healthy plants; (3) avoid over-watering; (4) avoid over-head sprinkling (irrigate instead).

(b) *Fungi (molds).* Thread-like organisms composed of long filamentous strands. Capable of producing microscopic spores (seeds). Found principally in the soil, and also in diseased plant parts. Capable of causing root rots, stem rots, bulb rots, fruit rots, wilts, and leaf spots. To prevent fungous diseases (1) treat seed (using a recommended seed treatment, i. e.,

Semesan, Cuprocide, etc.), (2) avoid using seed from diseased plants or transplanting unhealthy cuttings or bulbs; (3) avoid overwatering; (4) avoid over-head sprinkling; (5) spray plants for stem lesions or leaf spots (use sulphur for mildews and any fungicide containing copper for other leaf diseases); (6) where necessary and practical steam sterilize or disinfect soil patches. In disinfecting use tear gas (chloropicrin) or formaldehyde.

(c) *Insects.* No description necessary. Use recommended insecticides for chewing and sucking insects.

(d) *Nematodes.* Microscopic eelworms which live in the soil and in plant parts (bulbs, corms, roots, stems, etc.). Nematodes usually cause galls or tumorous swellings on the roots or stems of plants. To control nematodes: (1) avoid planting infected stock; (2) use steam, tear gas or formaldehyde to disinfect the soil; (3) where the soil is infested and soil-disinfestation is not practical, set out plants not susceptible to nematodes. Nematodes will die in two years in the absence of susceptible plants.

(e) *Viruses.* Believed to be chemicals (toxic proteins). Spread from plant to plant principally by insects, handling, and wounding. Not soil borne. Virus diseases can be recognized by *leaf mottling* (dark green and lighter green to yellow mottlings), and *distortion* of new growth. To control virus diseases: (1) remove and burn all suspicious plants; (2) keep the weeds down; (3) use recommended insecticides to keep plant lice from increasing.

(f) *Environmental agencies.* Insufficient nitrogen, potash, and phosphorous will cause weak and stunted plants. Leaves frequently are a sickly green to yellow. High lime in soil may bring about a deficiency of iron. Iron defi-

ciency causes leaves to become chlorotic or yellowed. For plants showing symptoms such as those just described add a complete fertilizer. For spots with high lime content add manure.

Don't overwater. Keep soil in a good moist condition. This is a general recommendation.

2. For detailed general information

on plant diseases and insect control write to the Colorado A. and M. College at Fort Collins, Colorado, for the free bulletins as follows:

Insects (bulletins D-39 and D-6), and Plant Diseases (bulletins D-8, D-9, D-10, D-11, D-21, D-43, D-44, D-45, D-46, circular WFA-G5, No. 481, No. 484, and 385-A.).

More Magazines

WE received a very interesting letter from Mrs. G. M. Jorgensen of Dell Rapids, South Dakota, secretary of the South Dakota Federation of Garden Clubs, which we print here for your information.—Ed.

I was much interested in your list of periodicals in the May-June issue of THE GREEN THUMB, and find that of the twenty-six named by you, I subscribe to twenty and have access to twenty-one. In addition, the following magazines and pamphlets may be of interest to other garden-minded folks as they are to me:"

NATIONAL PARKS, National Parks Association, 1214 16th St., N. W., Washington 6, D. C., \$3.00. Quarterly. Devoted to the preservation or restoration of natural conditions in our national nature reservations. Stories and articles about our national parks.

BACK TO EDEN, DeQueen, Ark., 50c. A flower and garden monthly with articles written by flower growers throughout the midwest. Homey and neighborly. Printed on newsprint. Many ads.

GARDEN GLEANINGS, Boring, Ore., 50c. Same as above.

THE GLADIOLUS MAGAZINE, New England Gladiolus Society, Horticultural Hall, Boston 15, Mass., \$1.00. Bi-monthly. All about glads, shows. Many ads. National and international in scope.

THE BEGONIAN, 158 S. Oxford Ave., Los Angeles 4, Calif., \$1.50. Monthly. Devoted to sheltered gardens, begonias and plants which grow in the shade.

CONSERVATION DIGEST, S. Dakota Highway Commission, Pierre, S. Dak. Free. Fishing and hunting within the state.

GARDENSIDE GOSSIP, Shelburne, Vermont. Quarterly. Not a magazine, but a price list in magazine form with such inspiring poems and confidential chats about the editor's plants that you will not want to miss it. He not only gloats over his own successes, even as you and I, but he tells all about his failures, too.

RAINBOWS END, C. W. Wood, Cope-mish, Mich., 25c. Monthly. A 3x6" booklet describing rare and unusual plants for the garden.

THE GARDEN PATH, Lancaster, Ohio, 30c. Quarterly. Official publication of the Ohio Association of Garden Clubs. Contains good gardening articles in addition to news of the clubs.

ARIZONA HIGHWAYS, Phoenix, Ariz., \$3.00. Monthly. The most beautifully illustrated magazine in America, many photographs in color. Devoted to Arizona's natural beauties.

MINNESOTA HORTICULTURIST, St. Paul, Minn., \$1.00. Monthly. Garden and garden club stories.

WISCONSIN HORTICULTURE, Madison, Wis., \$1.00. Gardening in Wisconsin.

NORTH AND SOUTH DAKOTA HORTICULTURE, Sioux Falls, S. Dak., \$1.00. Monthly. The magazine which is read by more people than any other magazine published in the state. Garden articles, birds and nature studies of the north prairie area.

HOME GARDENING, New Orleans, La., \$2.00. The southern gardener's magazine. Wild flowers.

Kansas, Virginia and Missouri also have magazines stressing the horticulture of their states.

SUNSET MAGAZINE, Lane Publishing Co., 576 Sacramento St., San Francisco 11, Calif., \$2.00. Monthly. The Pacific gardener's magazine, but contains much of interest to readers in other states, too.

PLANT LIFE, American Plant Life Society, Box 2398, Stanford University P. O., Calif. Each issue devoted to one plant family. Technical.

IOWA GARDENS, organ of Federated Garden Clubs of Iowa, \$1.00. Monthly columns on Hemerocallis, roses, wild flowers, etc.



Back in the summer of 1903 an early-day forester, W. J. Gardener, who was preparing a report on the need of reforestation on the Pike national forest, took a photograph showing a steep hillside burned over years before which was eroding badly, and on which natural restocking of trees was almost wholly lacking. A few scattered trees which had survived the fire that swept this hillside years before, were left to indicate the area originally covered with timber before fire burned over the area. In the spring of 1913 the area shown in Mr. Gardner's photograph was planted with ponderosa pine by the Forest Service.

Watershed Planting On The Pike National Forest

By JAY HIGGINS,

Chief of Planting, U. S. Forest Service

TAKE a look—take a good look—at the two pictures on these pages. Note the bleak and leprous appearance of those hills in the picture on the left. Count the trees—there are so few this should be no task.

Now examine the picture on the right—closely . . .

Yes: they are taken from the same spot, of the same hills—but between them lie four decades of time and one part of the story of U. S. Forest Service activity in reforestation, a phase tied in tightly with the vital matter of watershed protection.

Reforestation on national forest lands

devastated by early-day forest fires or on lands where the original forest cover was destroyed by excessive logging operations during the earlier settlement of Colorado, was actually started over 40 years ago by the Forest Service. From several small nurseries started but abandoned before 1907, a sufficient number of seedlings were produced to do a certain amount of experimental planting.

The final selection of a nursery site, however, was made in that latter year. That marked the beginnings of the Monument Nursery, at Monument, Colorado, about 50 miles southwest of Denver. Since that date millions of young coni-



The disintegrated granite soil which usually makes a most acceptable planting site for ponderosa pine proved to be a good one here. The survival of the trees planted is at least 80 to 90 percent. The last photograph of this hillside, located in North Cheyenne Creek canyon and visible from the Gold Camp road, was made in 1943, thirty years after the area was planted. Since the planting of this area was completed a new, man-made forest has come into existence. The original trees have grown larger during that time; but had it not been for the planting of this hillside in 1913, it would have taken several centuries before nature alone would have been able to do a planting job equal to that which cost about \$15 per acre to accomplish by artificial reforestation.

ferous trees grown at this nursery have been planted—largely on the Pike National Forest—although each of the other eleven national forests in Colorado have shared in the tree-planting program.

Altogether, on these Colorado forests, some 57 thousand acres have been planted, of which approximately three-quarters have survived. In this breakdown, all plantations on which there is a survival of less than 100 trees per acre, replantings, and areas destroyed by fire, are considered "lost." The Pike National Forest can claim the greater portion of the Colorado-planted acreage, for on that forest have been planted about 42,000 acres, of which over 33,000 acres are now in thrifty, growing stands.

Within the boundaries of Colorado, which has the highest average land elevations of all states, are found the head-

waters of four important rivers—the Colorado, Rio Grande, Arkansas, and Platte. For many cities and towns, the waters of these drainages have extremely high values for irrigation, power, and as a water supply. An adequate forest cover is vital to protect the watershed from erosion at the headwaters of these rivers, and to insure a regular and continuous flow of water.

One of the primary objectives of the Forest Service reforestation program is watershed protection; and these plantings, on the Pike National Forest, have been entirely on the watersheds which supply Colorado Springs, Denver, as well as numerous smaller towns, with the greater part of their water. For many years, the planting program on the Pike Forest as a whole, averaged 1,000 to 1,500 acres, annually. Concentrating, between

1912 and 1920, on old burns on the eastern and northern slopes of Pikes Peak, planting was carried on so that, today, between 9,000 and 10,000 acres of successful plantations may be seen growing there, observable from a car traveling on the Gold Camp road from Colorado Springs to Cripple Creek, and along the Pikes Peak auto highway.

The two principal species of trees used on this project have been Ponderosa Pine and Douglas-fir. Plantations established in 1912 or 1913 now fully cover the ground. It is not uncommon to find Ponderosa Pine trees in these areas well over 20 feet in height; with Douglas-fir, usually planted on the northerly or more favorable sites, often over 30 feet tall. In these earlier plantations, trees were spaced at six-foot intervals, although in certain instances many trees were planted 5x5 feet. Even the wider spacing has

resulted in an overcrowded stand of trees where good survivals were obtained.

In certain areas, many of these crowded trees were dug and sold commercially for ornamental planting. For example, some of the Douglas-fir plantations, where there was overcrowding, were thinned for Christmas trees about ten years ago. The original cost of establishing these plantations was about \$15 per acre. This cost, however, would be considerably higher at present-day wage rates. On several areas the cutting of Christmas trees, after they had reached an age of 30 years, produced a net return of almost \$60 per acre. In addition, there was left a better spaced and less crowded stand of trees on the area to continue the job of preventing erosion, preserving the watershed and, ultimately, producing a valuable crop of saw timber.



Hand dusting will be found quicker and easier than hand spraying of many flowers, shrubs and small trees. If the foliage is first wet with a spray from the garden hose excellent coverage and adhesion of the dust will be obtained.

CHAS. H. BEHSE, JR.

This matter of spraying is a big subject and far too little understood. One thing that has not been said elsewhere, is that your plants can only be as clean as your immediate neighbors permit. If you really want a clean place, you must become a spray salesman and help to spread the gospel of clean gardens.

Copied from ROBERTS REMINDERS,
September 1935.

Chlorosis of maple trees, characterized by yellowing of the foliage and eventual dying of the tree, is becoming serious in Denver. Either a soil deficiency or alkalinity of the soil is the usual cause. Regular feeding of the trees with a balanced chemical fertilizer with the addition of iron sulphate will generally materially help the situation.

CHAS. H. BEHSE, JR.

IN this alkali country, serious soil trouble develops at times and is best analyzed and corrected by regular soil testing. The correction may come through water control, using such correctives as sulphur; or in some cases by working in peat, bone meal, or some other specific soil ingredient that may be deficient.

Copied from ROBERTS REMINDERS,
April, 1940.

A good, late-blooming perennial that is not planted nearly enough is Cimicifuga. With tall, white spikes they make a striking sight in a shaded or partially shaded spot. Do not grow for cutting—the bloom smells like soap chips. There are several varieties varying in height and time of bloom.

PHIL BRINK.

Do We Need A Shade Tree Service?

By ERNST J. SCHREINER

Courtesy of AMERICAN FORESTS, magazine of The American Forestry Association, Washington, D. C.

MAN does not live by bread alone. Over the centuries he has been asking for more—for “a book of verses underneath the bough, a jug of wine, a loaf of bread—and thou beside me singing in the wilderness.” Verse, wine, bread, and song are immediately available to all who have the price. But the bough and the wilderness—that’s a different story!

These never will be available in the market place. Wherever city or town folk enjoy the shade of a bough, in their own backyard or in the “wilderness” of a park, someone had to preserve or plant those trees many years ago. Of course, large trees can be transplanted, but not at a price within reach of the common man. And vintage trees cannot be moved—not even for princes.

That shade trees are becoming increasingly important in the lives of the American people is an accepted fact. Evidence of this is plainly written in our own yards, in our parks and along our streets and highways. There is hardly a man, woman, or child who has not enjoyed the shade and beauty of trees; and their voices rise in protest when storms, disease, or insects blight shade trees in large numbers.

Since the advent of the automobile the appearance of country highways and byways no longer is a matter for concern only to rural people; there are few Americans, city or rural, who do not at one time or another travel by car or by bus on highways far from home. Who can estimate the meliorative effect of a tree-lined roadside on body and spirit?

The earliest settlers undoubtedly saved the best trees around their homes and on their village streets and squares. As the villages and towns grew in size and these original trees were lost through age, disease, or accident, householders and

town governments began to plant new ones. In the early days these were dug from adjacent woodlands, but during the past century tree planters have become more and more dependent upon commercial nurserymen. As a result, the urge to plant fast-growing trees or “something different,” combined with ignorance of tree requirements, has cluttered many towns and cities with short-lived trees and with natives and exotics thoroughly unsuited to the growing conditions.

Better shade trees are needed. And they can be developed by scientific selection and breeding. We need trees that can endure the difficult environment of city streets and parks, trees that are disease resistant, trees that can be grown into shapely specimens on poor sites, trees that will grow rapidly and live for many years. As a rule, fast-growing trees are short-lived, but there is sufficient individual variation to indicate that the breeding of fast-growing, long-lived trees is possible.

Trees such as the ailanthus (the tree that grows even in Brooklyn), Asiatic elms and soft maples, native and exotic, offer excellent possibilities for selection and improvement. The ailanthus has become virtually indigenous, grows under some of the worst environmental conditions conceivable, and persists in spite of excessive abuse even in the dingiest city streets.

The improvement of agricultural and horticultural plants by scientific selection and breeding is common knowledge. In recent years forest tree breeding, still in its infancy, has demonstrated that there are equal and even greater opportunities for the improvement of our forest trees. Yet, with literally thousands engaged in the breeding of agricultural and horticultural crops, there were less than a

dozen men engaged in tree breeding before the war, and there was practically a complete lapse for the duration. Tree breeding with many species will serve both the shade tree and forestry fields. The progenies derived from well directed breeding may be expected to include better shade trees and better forest trees; only the selection criteria will differ.

An increasing number of Americans, both urban and rural, are seeking information on planting and care of shade trees. Unfortunately, their questions can seldom be answered with assurance. Tree research, left largely in the lap of the forestry profession, both at home and abroad, has been marred by a serious lack of fundamental research based on trees as individuals. Foresters are primarily "sociologists" interested in the growth and development of trees in stands or communities; as a group they seem to have lost sight of the fact that in the final analysis the success or failure of the forest stand is dependent upon the growth and development of trees as individuals.

There is great and immediate need for extensive collation of existent research findings and for additional but correlated research to guide the home owner, the shade tree nurseryman and specialist, and the city, park and highway forester in the planting and care of *individual* trees. If the annual private and public expenditures for maintenance and care of shade and roadside trees could be compiled they would total millions of dollars. What better criterion is there of the intrinsic value of anything than the money spent year after year to obtain and maintain it?

Public interest in shade trees is largely individual and inarticulate; it seldom finds an outlet for unified expression. Nevertheless, education and research directed toward better shade and roadside trees is definitely a public responsibility that should no longer be postponed.

We need a National Shade Tree Service—a clearing house for tree research, an educational link between research and practice, and a source of information and education for the general public.

Tree research has been going on for many years, in many places, and the published results are very widely scattered. Consequently, there is today a serious need for correlation and integration of widely scattered observations and scientific information on the growth, development, and proper management of trees. Although this need is serious with respect to the sorting-out of information that would be immediately useful in practice, it is far more serious with respect to the "fundamental research aspects", the answers to the questions: How does a tree grow and reproduce? What factors affect its growth and reproduction? How can these factors and their effects be accurately measured?

A National Shade Tree Service with a relatively small but able and energetic staff of tree scientists, could serve as such a clearing house.

This Service would require an arboretum for certain phases of both its scientific and educational work. But a single arboretum, regardless of its location, can hardly have national significance either for such scientific purposes as the testing of exotics and new tree types, or from the standpoint of educational value to the public.

We need a network of cooperating arboreta covering all regions of our country if we are to provide a substantial proportion of our people with the educational advantages of an arboretum, and proving grounds for new and improved shade trees.

Do we need a shade tree service? To serve the public interest in trees—the interest of everyone who owns or enjoys shade trees—the answer is obvious.

CHEMICAL TREATMENT TO CONTROL FUSARIUM ROT OF GLADIOLUS¹

A. O. SIMONDS²

HAVE YOU ever had the sad experience of seeing some of your favorite gladiolus plants turn yellow and die just before they reach the blooming stage? And have you noticed that some of the corms, (sometimes mistakenly called bulbs) had reddish-brown spots on them when dug in the Fall? Did you know that these reddish-brown spots enlarge while the corms are in storage during the winter and frequently all that remains next spring is a shriveled black mummy instead of the healthy corm you expected to plant? These are the symptoms of a common gladiolus disease known as Fusarium rot. This disease, however, need not discourage you from growing gladiolus in your garden. Treating the corms before planting will give good control of the disease.

Corrosive sublimate has been used for many years as a pre-planting treatment for gladiolus because it gave good control of gladiolus thrips. It has been an effective treatment against the bacterial scab disease and Fusarium rot. In the past few years, however, New Improved Ceresan has been used for the control of Fusarium rot by many gladiolus growers in the east and mid-west. Because no information on treatment of gladiolus in Colorado was available, an experiment was set up to compare the effects of using corrosive sublimate and New Improved Seresan on gladiolus in this area.

¹Misc. Series Paper No. 361, Colorado Agricultural Experiment Station. The treatments used in this experiment were suggested by J. L. Forsberg, Research Pathologist, Illinois Natural History Survey, Urbana, Illinois who was formerly Assistant Plant Pathologist, Colorado A and M College, Fort Collins, Colorado.

²Associate Professor of Botany and Plant Pathology, Colorado A and M College.

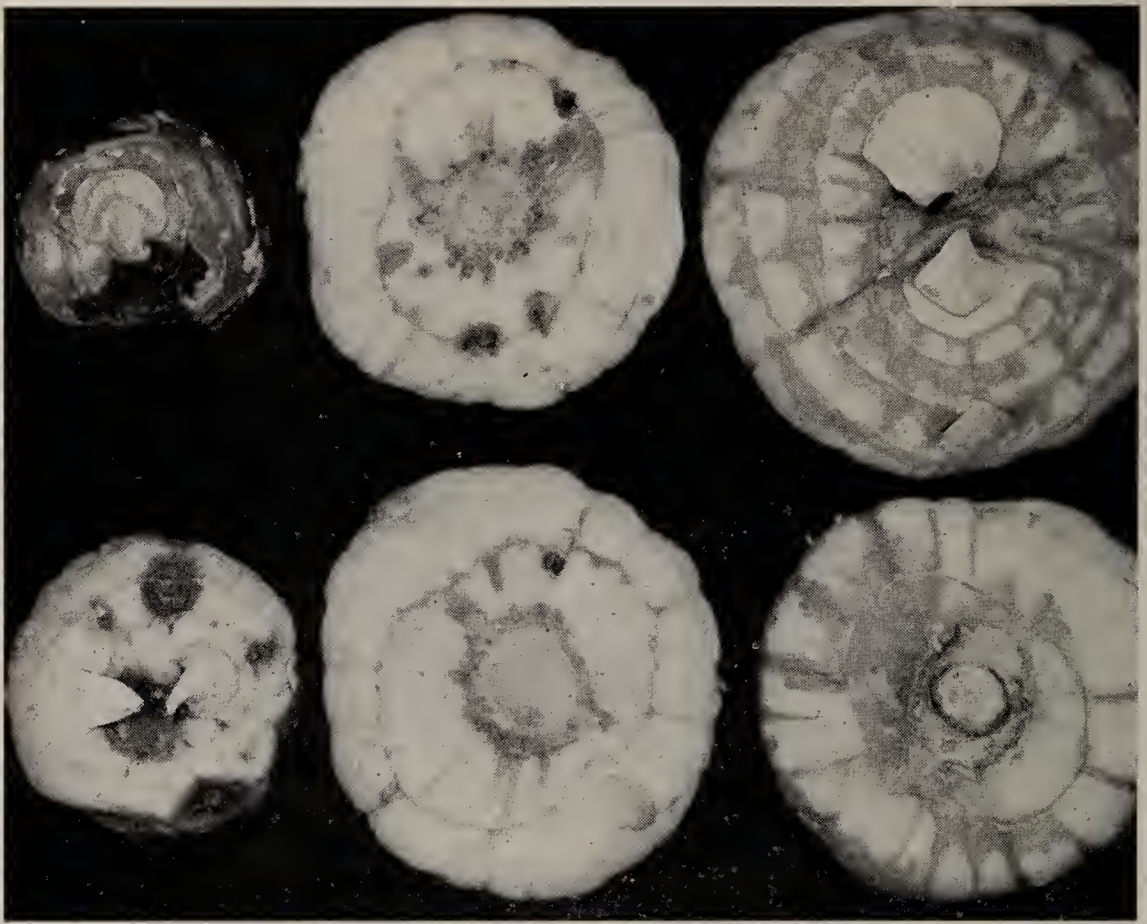
One hundred and fifty healthy corms of the Picardy variety were divided into three lots of 50 corms each. One lot was soaked over night in a 1:1000 solution of corrosive sublimate. A second

lot was soaked 20 minutes in a solution of 9 grams New Improved Seresan and a teaspoonful of Dreft, to act as a wetting agent, in a gallon of water. The third portion was left untreated as a check. On May 11, 1946, immediately after treating, the corms were planted in a randomized block arrangement in the author's garden in Fort Collins, Colorado. Corms were spaced 4½ inches apart in double rows, the rows being 6 to 7 inches apart. Gladiolus had been planted in the same soil in 1943. All plants were sprayed with D.D.T. three times during the summer to reduce thrip damage.

The effect of the treatment became increasingly evident as the season advanced. Some of the plants wilted and turned yellow, and leaf veins became brown before the plants died. On August 7, 46 plants in Seresan treated lot and 45 plants in the corrosive sublimate treated lot appeared healthy. Only 28 plants in the untreated lot appeared healthy.

Certain chemical treatments of corms have been reported to delay blooming in other areas. It was apparent that the treatments used in this experiment had delayed blooming to some extent when flowering records were taken August 17. On that date, when the first blooms were open, 6 plants in the untreated lot, 4 in the Ceresan treated lot, and 1 in the corrosive sublimate treated lot were in bloom. However, considering only the healthy plants at that date, 38 or 82.6 percent in the Ceresan treated lot, 28 or 62.2 percent in the corrosive sublimate treatment and 19 or 67.8 percent of the untreated checks had produced visible flower stalks by that time.

Corms were dug October 26 and cured in a dry basement until December 14 when they were cleaned. At that time



Left corms have Fusarium rot, middle two have scab and small amount of thrip injury. The right two show the russetting effect of severe thrip injury.

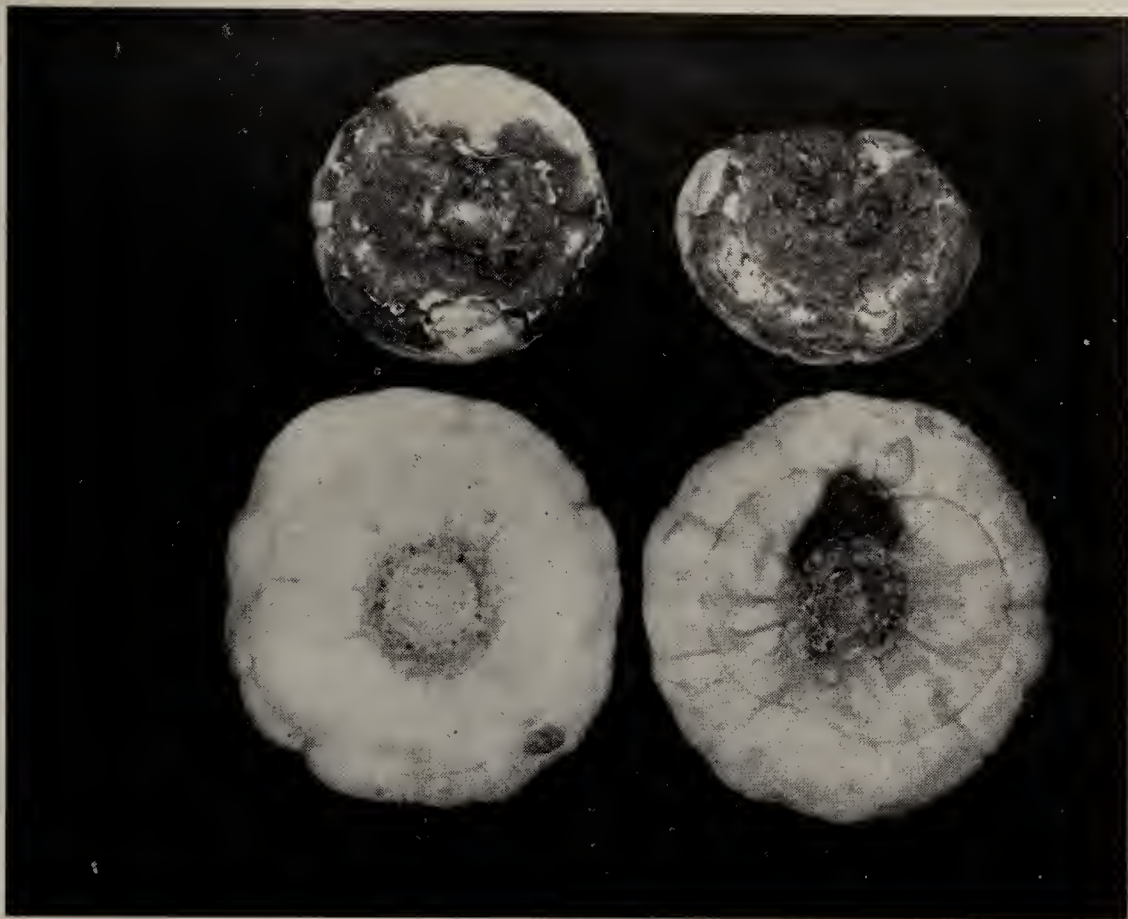
41 corms in the Ceresan treated lot and 40 from the corrosive sublimate treatment showed no evidence of Fusarium rot, but only 17 healthy corms were obtained from the untreated lot.

A noticeable difference in the size of corms was observed at cleaning time so all living corms were weighed. Corms from the untreated lot had an average weight of 42.8 grams, corms from the Ceresan treated lot averaged 41.0 grams and those from the corrosive sublimate lot averaged only 29.9 grams. From these figures it appears that the corrosive sublimate treatment greatly reduced the size of the daughter corms.

The number of healthy corms obtained from each of the treated lots was more than double the yield from the untreated lot. The average size of corms produced was considerably smaller when corrosive sublimate was used than when New Improved Ceresan was used or

when the corms were planted without treating. The effect of treatments on flowering was not marked but the corrosive sublimate treatment tended to delay blooming a few days.

This experiment was not extensive and it has been run only one year, but on the basis of these results and those of workers in other areas, New Improved Ceresan is recommended for the control of Fusarium rot of gladiolus. Thoroughly mix one ounce of the Ceresan with one or two teaspoonfuls of Dreft, then add enough water to make a thin smooth paste and finally add enough water to make three gallons of solution. (Avoid inhaling New Improved Ceresan dust and do not get paste on hands or clothing.) Corms should be soaked in this solution for 15 to 20 minutes and planted immediately after treating. It is not advisable to plant in soil that is too dry.



Lower left—Normal gladiolus corm, other three show various stages of Fusarium rot.

Chinese Elm and Maple

Advice given twelve years ago is still good.

Q. We have a Chinese Elm in the side yard that is just four years old but it's getting to be quite a large tree. Is there danger of it growing too fast? The top is getting big and heavy and very dense. Is any trimming needed and if so when should it be done?

A. Chinese Elms are dryland trees and when given an abundance of water, make a big, soft growth. In this condition they are very apt to be injured by high winds or heavy wet snows. Withholding water is the best correction but once established in a well watered yard they grow very fast regardless of the water in their immediate neighborhood as the roots extend under quite an area. In other words, this is not a good yard tree.

But your problem seems to be to get the most out of an established tree that is overgrown. Such a condition calls for very thorough, careful pruning. The tree should be thinned by the complete removal of occasional limbs and particular

attention given to removing any forking in the leader. Then the entire tree should be headed and shaped, thinning the growth on the heavier branches. All this sounds like a lot of work, and it is. A tree of any size is a job for a tree trimmer rather than an amateur, and an overhaul such as this is indicated about every three years. Failure to keep such a tree within bounds subjects it to the risk of being torn apart when subjected to unusual weather strains.

Copied from ROBERTS REMINDERS, September 1935.

Q. What is the proper time to trim Maples?

A. Any time from the first of July to the end of October is the proper time to trim Maples. Trimming during the dormant season causes bleeding which greatly injures or may kill the tree. Once a cut starts bleeding, there is nothing to be done.

Copied from ROBERTS REMINDERS, September 1935.

Fall Work

THIS is the time of year to think about closing up our gardening activities. For better or for worse most of our gardening is now a thing of the past. There are many things, however, for good gardeners to busy themselves with.

Careful watering should be given consideration for the next few weeks. Excessive watering now may cause trees or shrubs to put on new growth which will not have time to properly ripen before frost. All hardy plants should have a ripening period just before growth stops for fall. Then, when the trees and shrubs have properly ripened and the leaves have fallen, indicating that they are dormant, they should have a good soaking so that they freezeup wet. If these two things are done, two causes of "winterkill" will be eliminated.

Before the leaves fall is a good time to take dead wood out of shade trees. It is easily seen then. The more extensive trimming may be left for a winter job. While you are trimming give that hedge a good hair cut so that it will look neat until spring. And, talking about neatness, get out the rake and clean up the rubbish. Remember to save and compost all weeds, grass and leaves which can be made into our much needed humus.

In favorable years lawns can be patched up until the last of September. Grass planted later may grow for a while but is very likely to winterkill.

Some things must be planted in fall, and a greater number may be. Peonies, some lilies, bleeding hearts and Dutch bulbs are among the musts. Hardy perennials, the tougher of the shrubs and a few quick growing trees may be planted in fall after the leaves fall and the trees are dormant.

Put notes down on paper now about the things that you want to improve or remodel in your garden. By next spring you will have forgotten just what you wanted to do. Look up the firms that

can furnish the things you need and get in your order.

Repair tools, fences, walks and furniture. Plan to protect them through the winter.

Plan a definite line of gardening study for the fall and winter. A few minutes in the evening, once a week, can give you a good lot of valuable and interesting information. Let us help you line up a course of study. Plan to take in our regular public meetings at *Horticulture House*. If several people request a certain line of study we will attempt to line up a series of classes in this subject.

Take time now to enjoy your garden and visit your neighbors who have good gardens. Get acquainted with your fine city parks and discover what beauty there is in our mountains in the fall. If you have worked hard all year you deserve to take time to enjoy things now.

GEORGE W. KELLY.

Only by careful inspection, can you be sure if your maple trees are infested with cottony-maple scale. The color of the foliage may be perfect and still the trees be so badly damaged that serious loss will result.

PAUL BRADFORD.

Somewhere, some one has said something like this—

Two spits. The old English name for the depth of a spade is a spit and the directions for digging with a spade are so gauged. Probably if they called it a spit American gardeners could be persuaded to dig deeper. Scarcely a plant or bulb but is benefitted by deep digging and fertilizing. The gorgeous Delphinium, rose bushes, the short-spanned annual, the Lily, the Narcissus—each alike asks a fair chance given them by deep digging, and unless this preparation is made they can't be expected to grow lustily. So we might make up a rule: One spit possible failure; two spits success.

HELEN FOWLER.

What Does YOUR Membership in **The Colorado Forestry & Horticulture Association** *Mean?*

To the ASSOCIATION:

It means your support of a worthy cause, for the Association is pledged to:
 the preservation of the natural beauty of Colorado;
 the protection of her trees and other plant life;
 the proper maintenance and additional planting of gardens, flowers, shrubs, and trees;
 the establishment of a Botanical Garden or an Arboretum in the vicinity of Denver;
 roadside parks and botanical reserves throughout the State;
 the publication of a magazine devoted to correct information regarding forestry and horticultural practices; plants best suited to the climate; coordination of the knowledge of foresters, horticulturists and gardeners for their mutual benefit;
 a connecting medium between the association and the member.

To YOU the MEMBER:

It means an association with hundreds of other green-thumbed lovers of plant life in the garden, in the city park, on the farm, throughout the plains and mountains, or wherever it may be found;
 a free subscription to the official bulletin, THE GREEN THUMB, published bi-monthly and fully complying with the original intent of its existence as outlined above.
 the use of HORTICULTURE HOUSE, rebuilt and charmingly furnished by its sponsors, for members or committee meetings, classes, lectures and displays;
 the use of its Library and Herbarium which contains an outstanding collection of books, current magazines, plates, pictures and specimens, covering every phase of plant life;
 the advice and counsel of a trained horticulturist to help solve your horticultural problems.

Memberships in THE COLORADO FORESTRY & HORTICULTURE ASSOCIATION are:

Name	Annual Fee	Name	Annual Fee
Supporting	\$ 2.00	Patron	\$ 25.00
Sustaining	5.00	Donor	100.00
Contributing	10.00		

Privileges and benefits to each class are the same:

the lower fee goes almost entirely to publication of THE GREEN THUMB;
 the higher fees over the cost of such publication go to the upkeep of salaries and expenses.

All Memberships run thru the calendar year—January 1-December 31:

those received after January 1 are retroactive to that date and earlier copies of the bulletin will be sent to compensate.

Contributions to the Association may be deducted from taxable incomes, and a legal form of bequest is as follows:

"I hereby bequeath to The Colorado Forestry & Horticulture Association, soon to be incorporated under the Laws of Colorado, the sum of....."

Requests for further information should be addressed to the Association at 1355 Bannock Street, Denver 4, Colorado.



The Green Thumb

VOLUME 11 NUMBER 1 1927



A Bulletin of the **COLORADO FORESTRY AND HORTICULTURE ASSOCIATION**

Organized in 1884 — Denver, Colorado



White Fir—*Abies concolor*

Our Colored Illustrations

Mr. Arthur Hill, President of the D. Hill Nursery of Dundee, Illinois, has generously lent us the plates for the seven colored pictures shown in this issue, to make it a climax number of the year. The trees shown in these illustrations range from the tall and stately *White Fir*—native of Colorado and thought by many to be our most beautiful native evergreen—to the dwarf *Hill Japanese Juniper*, that never exceeds twelve inches in height, and furnishes a rock garden gem.

Next below the tall *White Fir* comes the serviceable *Pfitzer Chinese Juniper*, reaching an ultimate height of six or seven feet, with a spread of fifteen. The *Pfitzer* is perhaps the best “all purpose” juniper that grows.

Somewhat smaller than the *Pfitzer* is the *Hillbush Juniper*, a fine evergreen for foundation planting that takes many years to exceed four-foot dimensions.

The *Dwarf Japanese Yew* is still smaller, but plant it on the north or east side of your house. The rarity of the *Yew* in Colorado lends distinction to its possessor.

The *Mugho Swiss Mountain Pine* can be kept small indefinitely by vigorous shearing, while the *Andorra Creeping Juniper* (also to be kept from the south and west exposures) never grows higher than eighteen inches.

Thank you, Mr. Hill.



Andorra Creeping Juniper—*Juniperus horizontalis plumosa*

WHITE FIR

"He that plants trees loves others beside himself."—German proverb.

The beautiful *Abies concolor*, White Fir, is my favorite evergreen. This native tree of Colorado, which has attained a height of 100 feet, is pyramidal in shape with a dense habit of growth which makes it an excellent specimen tree. The needles which occur singly along the twigs are 1½ to 2½ inches long, soft to the touch, and vary from a silvery to a deep green. When a needle drops from the twig it leaves a smooth scar, one of the distinguishing characteristics of a fir. The mature cones are cylindrical, 3 to 5 inches long and stand erect. They are clustered at the top of the tree. Being evergreen it provides ideal quarters for birds the year around.

Planted in our cities the White Fir reminds us of cool mountain streams, of the fragrance of the forest, and the majesty of our mountains.

ALICE WOOD.

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Phone TABor 3410

"To preserve the natural beauty of Colorado; to protect the forests; to encourage proper maintenance and additional planting of trees, shrubs and gardens; to make available correct information regarding forestry, horticultural practices and plants best suited to the climate; and to coordinate the knowledge and experience of foresters, horticulturists and gardeners for their mutual benefit."

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George W. Kelly.....	Horticulturist, Colorado For- estry & Horticulture Association
Irvin J. McCrary.....	Landscape Architect
Mrs. Leroy McWhinney.....	Home Gardener
Mrs. Robert M. Perry.....	Home Gardener

Term Expiring in January, 1950

J. Lee Deen.....	Dean of Forestry School, Colorado A & M College
F. Herbert Gates.....	Colorado State Entomologist
Stanley H. Johnson.....	Manager of Safety and Excise, City of Denver—Home Gardener
Mrs. E. R. Kalmbach.....	Former member of Herb- arium staff, Univ. of Colorado
Robert E. More.....	Lawyer and Evergreen Specialist
M. Walter Pesman.....	Landscape Architect
Scott Wilmore.....	W. W. Wilmore Nurseries

WE ARE ASTONISHED! PUBLIC DOESN'T KNOW US

DO YOU suffer from nematodes in your nasturtiums? Are your *Gladiolus* corms (please, not "bulbs") afflicted by *Fusarium* rot? Is your ailing agriculture affected by amateurism?

Or have you that "Green Thumb"



*Mrs. John Evans,
President*

to which plant life responds; that friendly feeling for forestry and flora that touches the depths of your nature — and bores your mining engineer friend to profanemutterings?

In either case you should belong to the Colorado Forestry and Horticultural Association.

If you *are* a member, keep right on reading. This will intrigue you:

Recently we learned that many people think the Colorado Forestry and Horticultural Association is (1) a branch of the federal government; (2) a division of state government; (3) a sort of patriotic organization that plants trees in prominent places as a public service, or (4) a semi-official body acting as adviser to municipal, state and national experts on forestry and horticultural matters. There also seemed to be a vague suspicion that the Association's operating funds are derived from some public exchequer.

These misconceptions do not reflect on public intelligence; rather, they indicate a lack of promotional vigor on the part of members or manage-

ment (all of them private citizens who will be much surprised to discover that they are presumed to be public officials). Green Thumb devotees are apt to spend more time comparing notes on their vegetable gardens, flower beds or botanical discoveries than in proselyting new members; and those are the men and women who constitute the Colorado Forestry and Horticultural Association.

To be even more precise: The CFHA membership consists of folks like you and me, who like to see things grow, and more particularly, who enjoy *making* things grow or learn why they won't. Their reasons may be personal or professional but are always animated by that deep-seated *something* which has its roots in Nature and natural phenomena.

The CFHA is presently composed of adults banded together by their community of interest in trees, flowers, landscaping, shrubs, hedges, lawns, vegetables, fruits, soil erosion, plant diseases, fungus growths, etc. Friday is the principal day for meetings at the new headquarters building, 1355 Bannock Street, Denver, with speakers of note on subjects from Aphis to Zygophyllaceae. Members are listed from Alabama to Wyoming, with the greatest concentration in Denver, Colorado Springs, Fort Collins and Grand Junction. Those who are unable to attend lectures, meetings and study classes know what is going on through "The Green Thumb" issued bi-monthly, beautifully illustrated and delightfully informative.

The Colorado Forestry Association has been in existence since 1884. Several years ago—to give the organiza-

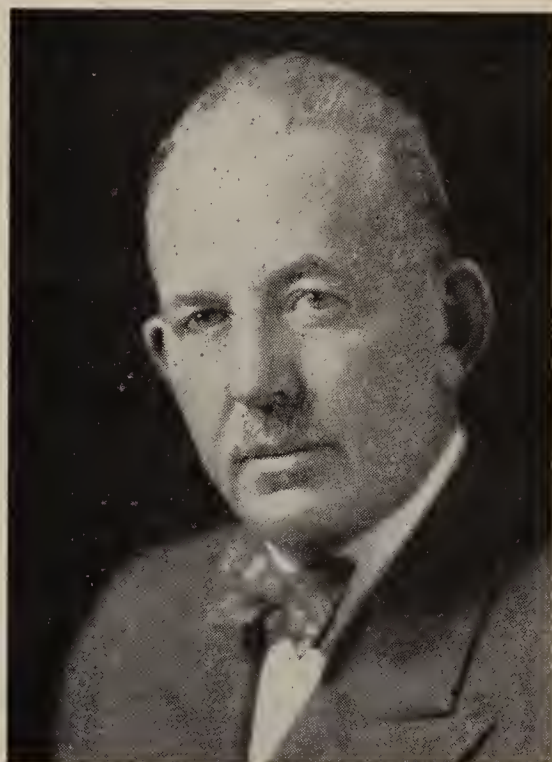
tion a wider sphere of usefulness, the Horticultural phase and title were adopted. Membership rolls include 1300 names, representing occupations that run the gamut of human endeavor—farmers, ranchers, housewives, brokers, capitalists, truck gardeners, active and retired businessmen and college professors; all have a common avocation in their Green Thumb works or ambitions.

Until recently, the Colorado Forestry and Horticulture Association had no real *Home*. Thru the generosity of Mrs. John Evans, Horticulture House on Bannock Street was rehabilitated and made available to the organization. It is equipped with a magnificent library, available to members at all times.

Recognizing that CFHA has been a little selfish, self-centered or clanish in failing to share the great benefits and enthusiasms concentrating at Horticulture House with a larger number of Green Thumbers, the or-

ganization is launching a membership campaign—actually asking men and women of kindred spirit to join!

The goal is a doubled enrollment—approximately 1400 new members—2,600, divided into the following



Henry Swan
Denver Campaign Chairman



Robert E. More
General Campaign Chairman

classifications: Supporting, 1000 at \$2.00 a year; Sustaining, 400 at \$5.00 annually; Patrons, 100 at \$25.00, and Donors, 20 at \$100 a year.

One immediate result of the additional membership will be monthly issues of "The Green Thumb" instead of six times a year and even better material. (Lack of funds has prevented use of some color cuts the editorial staff has been fairly itching to run.) Another benefit will come through expansion of the library. Furthermore, increased income will mean more personnel to render a greater variety of services more promptly (inquiries and answers, for instance).

Financial support provided by the

Continued on Page 20

These Things Your Association Has Done

Since Moving Into Horticulture House

ARRANGED public meetings in Horticulture House to bring the latest and best in Horticulture to members and friends. These meetings have been conducted every Friday evening, and usually one other evening each week. We have had an attendance of from 20 to 60 interested people.

Answered hundreds of questions by phone, mail and person.

Furnished speakers for dozens of Garden Club meetings.

Provided radio talks many times when requested.

Collected hundreds of wild flowers and pressed them for use in the Herbarium.

Collected and cataloged well over a thousand books in the library.

Inspected many mysterious ailments of trees and flowers.

Collected and published important articles regarding Colorado plants and gardening practice.

Encouraged gardening through participation in flower shows.

Contacted government officials in regard to help in solving pest problems of trees.

Attended national Horticultural conventions to bring back the latest word in Horticultural practice.

Assembled an extensive collection of horticultural magazines.

Brought together people of similar interest, such as the Rose enthusiasts, and the commercial nurserymen and landscapers.

Interested city officials in improved plans of city forestry.

Arranged tours of city parks and parkways.

Conducted wildflower and garden-study tours.

Made contacts which will lead to

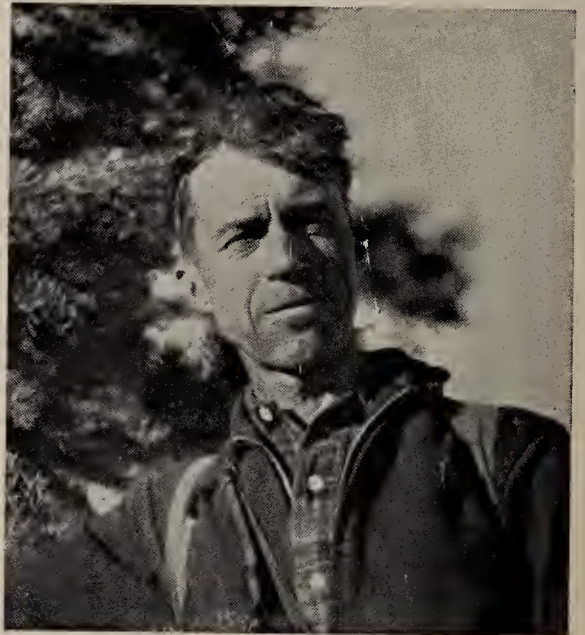
the establishment of a Rocky Mountain Arboretum.

Assisted in planning Memorial highways through the state.

Provided publicity regarding Horticulture to the daily papers.

Issued warnings through the papers of serious infestations of plant diseases or pests.

Arranged for the setting aside of botanical reserve areas.



George W. Kelly, Editor

Investigated the legal status of State Parks so that they may be established at the earliest possible time.

Assisted in identifying unknown plants.

Assisted various organizations to select suitable areas for the establishment of roadside parks.

Planted and developed attractive plantings surrounding Horticulture House.

Arranged exhibits of flowers and plants at Horticulture House.

Continually encouraged the plant-

Continued on Page 23

Donors to Horticulture House and Library

HORTICULTURE HOUSE has recently been the recipient of some fine gifts. We have received over one hundred and twenty beautiful botanical paintings from Mrs. Frank C. Ervin, a portfolio of artistic flower prints from Miss Carla Swan and Mr. Henry Swan and fifty-six books from Mr. Charles L. Hover of Longmont including L. H. Bailey's "Cyclopedia of American Horticulture" in four volumes. Mr. B. M. Hurwitz gave us fifty books which will be of interest and use to our members, and we received a beautiful set

of "Luther Burbank, His Methods and Discoveries" from Mrs. Wm. C. Russell.

Books have been given in memory of Mrs. Harold Kountze by the Garden Club of Denver, Mr. and Mrs. John Evans, Miss Florence Martin and Mr. and Mrs. Hudson Moore, Jr.

In addition to the donors mentioned in the July "Green Thumb" we would like to thank the following people for their generous contributions of time, of beautiful flowers, of books and for their interest in the Colorado Forestry and Horticulture Association:

Mrs. C. Walter Allen
Mrs. George O. Argall
Mrs. Chas. H. Boissevain
Mrs. Margaret C. Booth
Mrs. Francis E. Bouck
Mrs. Delbert L. Carlson
George A. Carlson
Mrs. Ward Chadwick
Mrs. J. W. Coxhead
Mrs. Z. E. Crook
Mr. & Mrs. C. Earl Davis
Charles M. Drage
Mrs. E. R. Dunlevy
Mrs. Theron R. Field

Mrs. & Mrs. J. H. Gabriel
The Garden Center
Henry Gestefeld
Dr. & Mrs. H. H. Gile
Mrs. Rowland Goddard
Mrs. Numa Hayes
Mrs. Grant Hudson
Mrs. Leland Lewis
Mrs. Alonzo Lilly
Mrs. Frank McLister
Mrs. W. P. Mellen
Miss Lula R. Morse
Miss Emma Modellmog
Mrs. A. D. Myers

Mrs. Jesse H. Newlon
Mrs. John W. Newman
Mr. & Mrs. R. J. Niedrach
Mrs. Blanche J. Oakes
Mrs. W. E. Pemberton
Earl Phipps
Senator and Mrs. Lawrence C. Phipps
Mrs. Edward Ring
Mrs. R. S. Sizer
Mrs. J. Stancil Smith
Mrs. Stanley T. Wallbank
Dr. & Mrs. J. J. Waring

STATE FOREST SURVEY

As mentioned in the March-April issue, Mr. Alfred B. Hastings of Washington, D. C., working with State Forester Everett J. Lee, completed during the summer a very thorough survey of the State's forest resources. As soon as his work has been checked and approved, Mr. Hastings will submit a report which will be available for reference.

Mr. Hastings, representing the Society of American Foresters and the Charles Lathrop Pack Foundation, made this survey without cost to the State, following a formal request made by former Governor Vivian.

Our Association sponsored the project.

WHEN SHOULD DORMANT SPRAYING BE DONE?

Dormant spraying may be done any time after the leaves have fallen and before they come out again in the spring. There has been a feeling among some that fall spraying is not as effective as late winter or early spring, but in the collective experience of the several ornamental tree spraying men of Denver there is no foundation for this thinking. Many of them even prefer early fall spraying and feel that the results are better.

The principal factors governing the time of street spraying are: the trees should be dry; very little wind should be blowing; the temperature should be above 36 degrees.



On opposite page, Oneseed Juniper in Garden of the Gods by H. L. Standley.

To Right, Yucca by A. Haanstad. Other pictures by George W. Kelly.



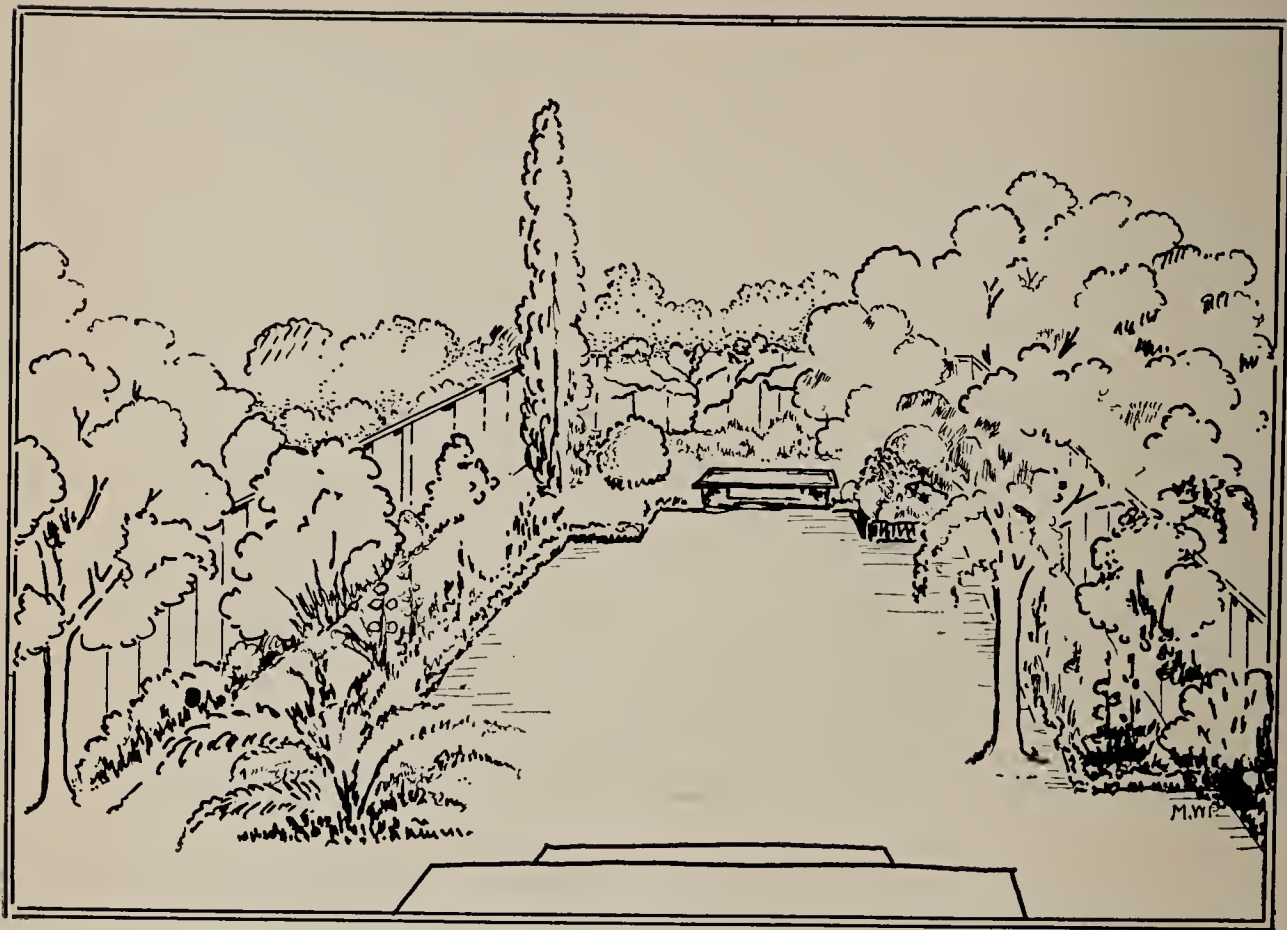
COLORADO BOTANICAL RESERVES

The first three units of a state-wide system of botanical reserves were set aside by appropriate ceremonies in the Garden of the Gods at Colorado Springs, August 27th.

One area consisted of a nob hill in Palmer Park which was almost entirely covered with the native Yucca or soapweed. The second area was in Cheyenne Canyon and contained some very fine specimens of White Fir as well as a large assortment of native shrubs and trees. The third area was in the Garden of the Gods and contained a number of very old Oneseed Junipers. Some of these had been rather accurately estimated to be from nine hundred to one thousand years old.







IN MY GARDEN

Saturday Afternoon Observations by the Week-end Gardener.

How does it happen that my neighbor's garden still has some bloom in it and looks well, and mine looks like the last rose of summer? I must go over there and see what they have that I do not have. Mainly 'mums, I guess, but there is evidence of many other things that are now gone. They had petunias, marigolds and zinnias to fill in between the perennials. And here are stems which look like perennial phlox that must have been in bloom until just a few days ago. I'll bet that they could tell me of a dozen or so other flowering plants that bloom late and make their garden look colorful in the fall. Suppose I go over and talk with them. I don't like the way they dress, or the color of their car, but they must be good gardeners, and good gardeners are essentially good people.

I wonder if I couldn't also find some good books that would tell me about new plants and new ways to use them. Of course, most of the good books are written for other climates, but it is possible that some of the folks down at Horticulture House might help me to weed out the good from the bad and find the things that apply to my situation. There is little that I can do for my garden now, but I might study about what others have done, and find out how to improve it. Now would be a good time, while my mistakes are fresh in my mind. How about asking them at the "House" to suggest a course of study for me this winter. It would be fun, and I might learn how to make a better garden next year. I guess that I'm never too old to learn unless I think so. I'm going in right now and start a list of things that I can do to make my garden better. If I add to this list all winter as I talk to my good gardener neighbors and read some of the gardening books, I should be able to have a garden next year to be proud of.

NATURE TRIPS

THE Alpine Flower Trip led by Mr. and Mrs. C. Earl Davis August second and third was successful since everyone worked. On a collection trip it is necessary not only to identify the specimens but to press and dry them as quickly as possible. We were fortunate in securing the use of the Zipfelberger cabin on Loveland Pass Saturday night. Any flower lover who hasn't seen alpine plants in their native habitat has a rare treat in store. Since the flowers were especially beautiful this year, the specimens, when mounted, will be of use to our members for many years. This trip will be long remembered by Mrs. Leroy McWhinney, Susan McWhinney, Emma Modellmog, John Davis, George W. Kelly and Alice Wood.

One of the most enjoyable trips of the season was the tour of Denver Gardens led by Mrs. Helen Fowler August seventeenth. We were first shown how important design is in a garden, large or small, then the use of interesting plant material in sun and shade. I particularly remember the terraced, formal garden of Mr. and Mrs. George H. Garrey, the beautiful rose garden of Mr. and Mrs. Donald C. Bromfield, the begonias and ferns at Dr. and Mrs. Leonard Van Stone's and the garden of Mrs. Roger D. Knight, so full of bloom though planted only this year. Also notable for its bloom was the garden of Mr. and Mrs. E. M. Thomasson. There were lovely color combinations and good plant material in the gardens of Mr. and Mrs. Eric Douglas and Mr. and Mrs. Oscar Temple. After visiting the gardens the party of thirty-six people enjoyed a picnic lunch in City Park.

On September thirteenth, fifteen people assembled at Horticulture House before visiting the beautifully

landscaped estate of Mr. and Mrs. Jan van Houten. Our leader, Robert E. More, pointed out the many kinds of evergreens there including the One-seed Juniper, Rocky Mountain Juniper, Black Hills Spruce, Bristlecone Pine, two magnificent hedges of Pfitzer and Tamarix Juniper and the finest Eastern White Pine in this area. In the garden of Dr. and Mrs. T. E. Best we saw various grafts of *Juniperus virginiana* and *J. scopulorum*. The group then visited Mr. More's city home where he has over fifty varieties of evergreens, including his "perennial border" of dwarf evergreens.

It is leaders such as these who are contributing so much to the Colorado Forestry and Horticulture Association.

ALICE WOOD.

GORE RANGE BOTANICAL TRIP

Superb scenery, perfect weather, glorious moonlight nights, excellent camp cuisine a la Timm, competent leadership of Charles Brown, and congenial companionship served to make the Gore Range trip a memorable one for the ten nature enthusiasts who participated in the Labor Day weekend camp. The party left Horticulture House on Saturday morning, August 30th, and returned Monday evening, September first.

Our camp was made in the National Forest area near Black Lake in Summit County. The two days were spent in exploring the trails into the surrounding hills and collecting specimens and seeds. Composites were the dominant plant family at this time of year, many of which gave us some good work-outs in identifying species. The area showed promise of a good collecting ground for an earlier season another year.

KATHRYN KALMBACH



COLORADO TREES

CITIZENS of Colorado have recently become more conscious of the value of street trees to their community. As towns and cities become larger and older it becomes more apparent that there must be some central control of the planting and care of the community's trees.

Many of the progressive cities of the East have developed ordinances permitting the city to have control of their trees, and these places have found that many benefits have resulted. When epidemics and threats of epidemics appear, as the Elm scale, Maple scale, Cedar-apple rust, Juniper aphid have in Denver recently, it strikingly emphasizes the absolute necessity of the city officials being able to take measures to prevent an irreplaceable loss of valuable trees. When we can only wait and hope that individuals will care for these things we are sure to have damage done which will cost a great many times the amount of a city wide control of trees.

One city in the state, at least, has an improved tree ordinance which enables it to look out for the welfare of its trees. That city is Colorado Springs.

To be sure, the city control of trees will increase taxes by a small amount; but the loss involved in an inadequate program is many times this amount, and the city suffers because of unsuitable and damaged trees.

Mr. L. C. Chadwick, of Ohio State College and one of the leading authorities on trees in the United States, has said in part:

"It is the duty of every citizen, and especially those interested in shade tree welfare, to see to it that their city has an effective ordinance regulating tree planting and maintenance.

Many cities are becoming conscious of the need of such an ordinance.

"It would seem to be highly desirable that all cities provide sufficient funds to employ an arborist who should have as his duties the supervision of all planting and maintenance of city trees. The city arborist should be well trained for his job and should draw a salary commensurate with his position. There are few positions in city government of more importance to the welfare of the community.

"As a result of a survey made a few years ago, it was apparent that **CITIES SHOULD EXERCISE COMPLETE CONTROL OVER ALL CITY FORESTRY OPERATIONS.** By complete control is meant that the city should appropriate sufficient funds so that **ALL REMOVAL, PLANTING AND MAINTENANCE OPERATIONS SHOULD BE DONE BY CITY EMPLOYEES UNDER THE DIRECTION OF THE CITY ARBORIST.**

"Other important considerations have to do with the choice of trees, their location and methods of planting. With city control, it is a simple matter to regulate against the planting of unsatisfactory species and varieties of trees. Where everyone is allowed to plant whatever trees they wish in front of their property, the result can only be a hodge-podge."

In this issue we print some suggestions for the planning of street planting in Colorado towns. This is the first installment of a series of four articles which will treat of proper trees for every location, care of trees, pests, trimming and such things. We hope later to combine these sections into a tree planting manual for Colorado.

ROSE NOTES

BY W. H. HOEFLE, *Treas., Denver Rose Society*

POSSIBLY the greatest problem rose growers in and around Denver have to face is **SAVING THE WOOD**. It is time they were considering this all important matter unless they are fortunate enough to have arrived at a way of saving all, or nearly all, of this year's growth for next year's bloom. Not that bush roses bloom on old growth. They positively do not, but the more old growth one can save, the more new growth one



may expect and, consequently, the more blooms. The so-called experts tell us that it is not the cold weather in this country that ruins our rose bushes, but the constant freezing and thawing that does the damage.

There are many factors that influence a rose bush entering the winter with a fair prospect of coming through, and the most important is age and health of the bush. The larger and stronger the bush, the larger and stronger it is likely to be after the winter has taken its toll. My roses average over ten years old and, as a result, I lose a lot of them each winter. Possibly old age and not the winter kills a great many of them.

My practice for a good many years has been to hill each bush as high as

I could with the soil I could move up to each one and fill the remaining space with fallen leaves. I spend a week's work in the fall and another in the spring removing the trash from the bed. Result—an average loss of ten percent of my bushes. The President of the Denver Rose Society tells me that his loss last winter from winter kill was exactly one bush, and I might here let out a secret. He does absolutely nothing in the way of protection, and his bushes look better than mine as a whole. I know of others who never make any attempt to protect their bushes and have wonderful results, and this winter I may be able to persuade myself not to cover any of mine. There have in the past two years been two very radical methods advocated by members of the American Rose Society, both in the far east. One is to cut the bushes back in the fall to the desired height, tie the branches together and then make a covering out of old window shades, building paper or anything else one may have that will stand the winter. They claim they never lose any more wood than they cut off in the fall. The other plan is to dig up all the bushes in the fall, heel them in in the same bed and re-plant in the spring. It seems like a lot of work and expense but if there is anything one can do to prevent having to start from scratch each spring it is worth while.

I have been distinctly disappointed with my roses this year. Our main crop was much later than usual and by the time it had gone the weather was already beginning to get hot enough to affect the new growth. By that time we should have had three distinct crops of bloom and be getting ready for our last crop. If the

killing frost stays away long enough, it is likely we will have one more good crop this year, if not, there is always another year. My greatest joy this year has been the rose, "Peace". While most of my bushes have been burned up or at least the blooms have been burned, "Peace" has produced a profusion of grand blooms. I often stand in front of my two bushes and wonder how they can be so good.

I have about come to the conclusion that my roses are getting too much sun. About one hundred and thirty

of the bushes are in a bed where they get sun from early morning until late at night, and thirty of them are in a place where they only get sun in the morning. While these last thirty bushes are younger, which might account for it, they have produced more good roses than all the rest of them together. I am going to move as many of the bushes out of the old bed in the full sun to the bed which only gets part sun. It will be lots of work, but if it produces results it will be worth while.



IN MY GARDEN

By the Week-end Gardener.

The low limbs of the Dolga crab hit me in the face as I came around the corner of the house. I'll have to cut them back a little, but I hate to do it and lose any of the beautiful red fruit. My neighbor tells me that this fruit is as good for jelly as it is to look at. I must try a Dolga crab tree for an espalier effect against the wall. It should make a brilliant show in the fall.

While I am trimming the Crab I am reminded to look at my Elm trees. Yes, there is still evidence of elm scale on them. I can see the tiny grey things in the crevasses of the bark and junctions of the small twigs, and the whole tree looks black and dirty. Here is a limb with some larger cottony white objects about a quarter of an inch across. They must be the cottony maple scale which has developed an appetite for other trees and shrubs. I must call a good spray man and make an appointment now for him to spray my trees when the weather is right, this fall or next spring. It would help to prevent re-infestation of my trees if I could induce my neighbors to have their trees sprayed at the same time.

I wonder if there are other things which might also need a dormant spray now. Yes, here are the tiny oyster shell scales on my Lilac stems and on my Cotoneaster and Dogwood too. How did I miss them all summer

There are quite a few limbs on the Elm trees that are already dead, or almost dead. I believe that I should have them trimmed out before the trees are sprayed, so that the spraymen can do a better job. While they are at it, they should examine that old wound where the large limb had to be cut off after the storm. There may be decay underneath which might continue down through the trunk of the tree and seriously weaken it.

How about my shrubs? I guess that there isn't much to do to them until next year right after they bloom. Maybe a few lippy stems to shorten back or an occasional large section to take out right down to the ground.

Oh, yes, let's see how the Chinese elm is fixed for the winter. Some of those lower limbs have grown away out there, and are still full of leaves. If a snow comes tonight they would surely break. I'll get someone to cut them back a little right now. I'll bet that the V crotch up there in the center of the tree needs a little cable or two to brace it when the snow weighs down the tree.

And that Colorado juniper on the north side of the house looks too tall and slim. What would a heavy snow do to it! Possibly I could brace it to the house with a small wire and a couple of screw eyes. Supper's ready? O. K., I'm coming. I feel better now that my trees and shrubs are all fixed for winter.

COLORADO STREET TREES

NO like amount of effort can do so much to improve the beauty and livability of a town as the proper planting and maintenance of shade trees. Trees give relief from the hot sun; furnish framing, screening, background and windbreaks for dwellings. The ordinary life processes of growing trees help to purify and cool the air. With their various flower and leaf and growth habits they add an informal beauty to a community, without which it would be bare and drab. Those used around dwellings may be of a great variety of kinds, and be planted in a great many different ways, but those used as street trees must be carefully selected and planted if they are to give the greatest satisfaction.

Most planting of street trees in the past has been done with no overall plan, consequently the results have been much less effective than might have been. Careful consideration should be given to the ultimate size and character of trees, and to the distance that they are planted apart. To plant trees, which will soon grow very large, close together or along a narrow street, is sure to cause future

From the fact that they are planted along a narrow street, there must be a certain formality in their arrangement. Usually there is a parkway provided in the layout of city streets. In the past this has often been too narrow for shade trees to grow well. This space between the curb and sidewalk should never be under 10 feet wide, and 16 feet would be much better. In residential districts the narrow curb walk is now often used. In this case the street trees can be planted at any chosen distance back from the curb and will have plenty of room for their roots to develop.

For most of the large growing trees, like elm, ash and maple, 50 to 60 feet is a good spacing. Smaller growing trees may be spaced closer, in some 20 to 30 feet. To plant young trees this far apart looks unreasonable at the time, but one has only to look over the older sections of any city to see the reason for this wide spacing. The spacing should have reference to the street as a whole, rather than to individual properties. fastigate trees may often be used.

It is a good practice to plant several varieties of trees in any commun-

Drawing below showing street trees with natural development when uncrowded. On opposite page, showing trees deformed by crowding. Picture on opposite page of fine old elm in City Park.



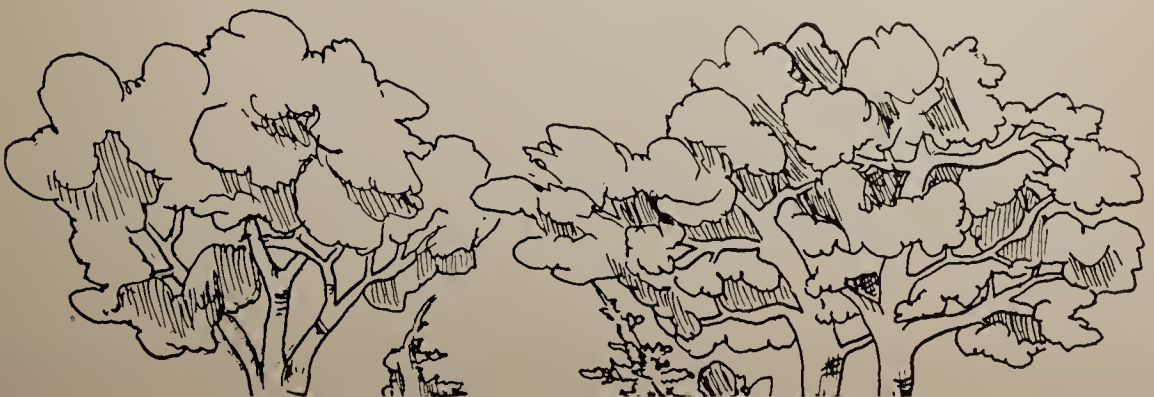


ity. This eliminates the possibility of epidemics of disease or insects, which attack certain varieties only, leaving the city barren of trees at some time. On the other hand, it is well to plant several blocks of trees of the same kind. This gives the desirable formal effect. It is seldom satisfactory to plant alternate trees of varieties having very different characteristics. The idea of planting temporary trees between the permanent ones sounds good in theory, but seldom works in practice, as the temporary trees are always just in their prime when they should come out, and no one has the nerve to remove them.

A wide street, or one where residences are set far back, may call for

spreading street trees, while a narrow street may require a narrow tree. Average size of buildings or type of soil may also influence the kind of tree selected.

Cities which have already planted some trees in a haphazard way, should work out a plan whereby in the next 10 or 20 years all the streets can be replanted according to a carefully worked out design. Existing trees of varieties which are not suitable, or specimens which are in bad condition may be taken out at once and the permanent trees planted. Often a number of existing trees may give the suggestion for completing the planting with more trees of this kind.





The W. W. MacGruder residence at 1300 Rosemary St., showing bed of mixed

THE HOUSE T

"THE biggest little house in America" stands at 1300 Rosemary Street, in Denver, surrounded by horticultural grandeur. At least, that's what the residence and grounds have been called by visitors from Texas, California, Montana, New York, Oklahoma and other points east, west, north and south. The property is, actually, better known nationally than locally.

It has also been described as "the most beautiful" in tribute to the trees, shrubbery, wrought iron fences, patterned flower beds (round, crescent, curved—all consistent with the master design) and landscaping. Exterior of the house glistens with white enamel paint, tile roof, flagstone walks and glass bricks. Patios abound, with comfortable outdoor furniture, a fish pond and two barbecue pits.



At Left — Two cone-shaped junipers Guard the side entrance.

At Right—Patio, fish pond and garden furniture outside a solarium at the MacGruder home. Contoured lawn boundaries are visible.



ennials next to porch, flowering crab at left and lilacs in the right foreground.

AT MAC BUILT

The residence belongs to W. W. MacGruder, Denver advertising and public relations executive, who heads W. W. MacGruder, Inc. He planned the interior arrangement, lawn, grounds, types of flowers (and where they should be planted) species of trees, landscape contours (there isn't a square corner to be found), hedges.

Mr. MacGruder's "green thumb" started it. He wanted to beautify the

property. Improving the lawn meant flowers here and there; also trees and ground-gripping vegetation. Mr. MacGruder planned each step a few days or weeks in advance. As the improvements, and task, became more impressive, he employed a tree specialist, a floral expert and, eventually, workmen to rehabilitate his house. (The five-room home had begun to look a bit forlorn amid such arboreal





Front door of the MacGruder home. Weeping birch on right, mountain ash, left of walk, and flowering crab in background.

and floral embellishments; it was expanded to nine rooms to provide a fitting establishment around which to plant things. Solaria command a view of the grounds in any direction.)

The Kentucky blue-grassed lawn, without a dandelion or plantain, is host to 650 varieties of flowers, including French, Hungarian and Persian lilacs. Trees are largely confined to evergreens, with a pair of cone-

shaped junipers flanking one of the flagstone paths. All vegetation, flora, shrubs and trees are regularly treated, at three-month intervals, to insure against blight or an insect invasion.

A study of the premises on the northeast corner of East Thirteenth Avenue and Rosemary Street will bring delight to any "green thumb" enthusiasts who happen to be driving in that neighborhood.

Closeup of wrought-iron fence which graduates in height as it approaches the street. Lilacs at left, perennials in foreground and Colorado juniper at right.

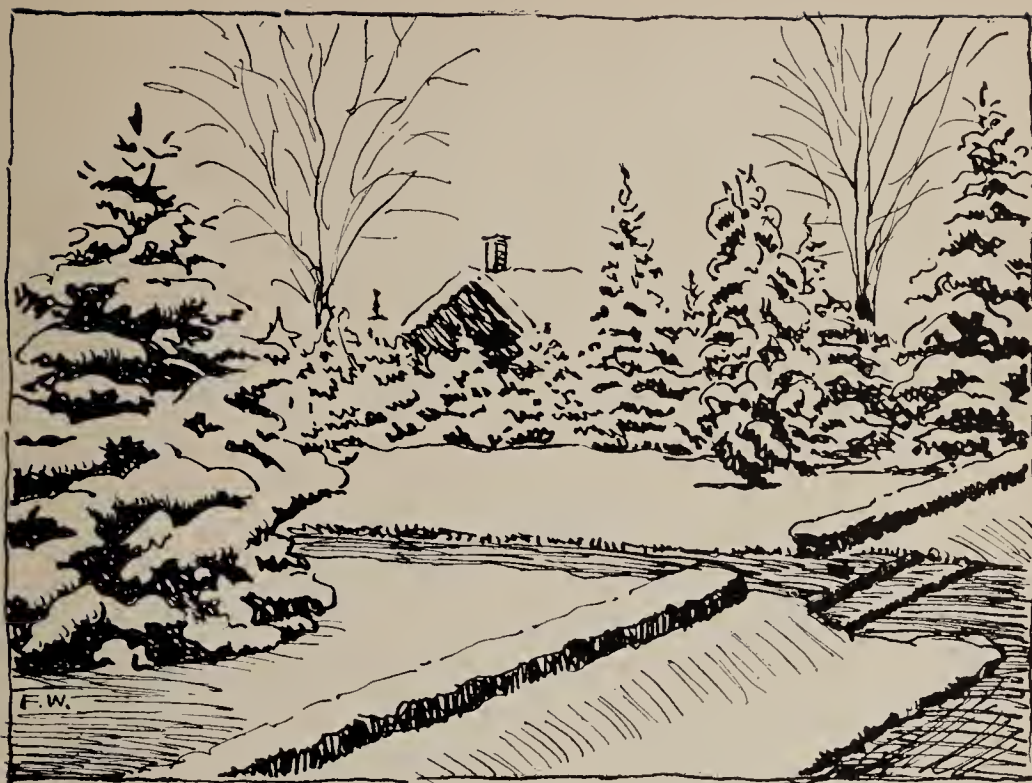


WE ARE ASTONISHED! PUBLIC DOESN'T KNOW US

Continued from Page 5

2600 new members will also speed progress on Altitude Botanical Stations to demonstrate which botanical specimens are best adapted to lower and higher levels. Most important of all will be the improved research facilities to make all phases of CFHA more valuable.

If each CFHA member will bring in one new member, immediate objectives of the Association will be accomplished—and fewer of the public will believe the organization is (1) a branch of government, (2) a patriotic outfit, etc.



IN MY GARDEN

By the Week-end Gardener.

I'm restless this Saturday afternoon. My lawn will not need mowing any more this year; the leaves are all raked up and put in the 'compost pit along with the dead annuals and perennial tops; the lawn and garden are soaked ready for the first freeze-up; and the hose is put away down in the basement. I'll just walk around and take another look. Whoops, I just about fell on my face. I'll have to fix that flagstone walk sometime. How about now? Let's look around and see if there aren't other things that need repairing. Sure, the gate has needed a new hinge and latch all summer, and that lattice-work surely needs a new coat of paint.

If I am ever going to have that tiny pool and rock ledge, I wonder if now would not be a good time to do it. That steep bank that can't be kept in grass and is always washing out might have a stone wall built to hold it in place, and it would make an interesting change of level.

That third Bolleana poplar is so full of blight that it is hopeless. I might take it out now. But, how would I get it down without breaking the fence and clothes line? Guess I'll have to get a man with ropes, and big saws, and a strong back and some know-how to do it. I can take out that old half-dead Spirea, it's about my capacity.

The flowers in the north bed never did well. Suppose I dig in there and see what the soil looks like underneath. Ah, here we have a batch of plaster from the house, and a few choice tin cans and an old glove. The whole mess looks as if it came from the bottom of the basement. I'll bet that if I took that dirt all out and filled in with good dirt I could raise nice flowers too. But, down about a foot there seems to be better soil, the original surface of the lot, I expect. I don't believe that it is necessary to throw all that soil away. I'll just mix a lot of good fertilizer with it and spade it deep, then see what happens. My neighbor says that he only puts fertilizer on the surface of his garden, but it seems to me that it should be down in the soil where the roots can get to it. I wonder what kind of fertilizer I should use. Most chemical fertilizers are quick-acting but last only a short while. I believe that I should put in some good, old manure or leaf mold and mix it thoroughly with the soil so that it would last a long time and induce the plant roots to go down for their nourishment. That job should take me several weeks.

FALL BULBS

BY PAUL BRADFORD

WITH the coming of fall the magazines and garden supply catalogues are alive with dazzling displays of color. They call our attention to the exquisite beauty of a crocus heralding the coming of spring. Spring—with hyacinths, narcissus, grape hyacinths, daffodils and tulips creating a riot of color; each struggling for supremacy.

It is my desire to give you a word of warning. If I can, I want to impress on you a few vital points so when the time comes you will have beautiful blooms that you are proud of instead of small lack-luster flowers that are always a disappointment.

First, buy good, top size bulbs. Many of the local dealers have large assortments of high quality bulbs. These are not to be compared with those selling for as little as a dollar or two per hundred. Good bulbs are the least expensive.



If you are going to plant bulbs of any kind this fall, it is time you prepared the soil for planting. They need a loose well-drained bed. If the soil is very heavy it will need both humus and sand to break it down sufficiently. Fertilizer must be deeper than in other flower beds. Be sure it does not come in direct contact with the bulbs. It will pay you to put from one-half to one inch of sand in every hole.

The most common and serious error made in planting is due to carelessness. *Be sure* and plant deep enough. Don't guess, get out your ruler. A little extra depth keeps many little bulblets from forming. In extremely cold areas tulips may be planted as deep as twelve inches and give lovely blooms.

Mass plantings are far more effective than long single rows. It is possible to have blooms for over two months from the plants we are discussing.

Do not hesitate to try some of the newer species. Many of the bicolor narcissus and daffodils are dependable and bring a new thrill from an old favorite.

I wish I could go into detail with the very large tulip family. There are over sixty species and several thousand horticultural forms. All of the wild forms are old world natives. There are three species I wish I could persuade you to try:

Kaufmanniana—showy, up to ten inches broad leaves but abruptly tapering. Flowers white or pale yellow with a red marked yellow center. The earliest flowering of all tulips—commonly called the water lily tulip.

Hageri—small coppery red with darker base, not over six inches high.

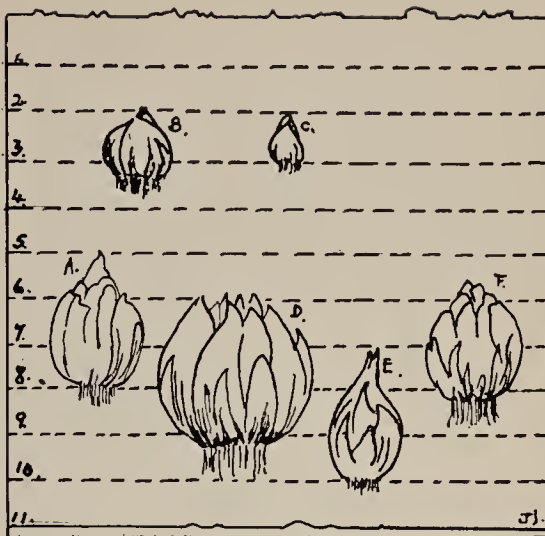
Now let me give you the one and only:

Eichleri—large crimson-scarlet flowers with spectacular yellow and black centers, not over twelve inches tall. Words cannot tell you of its rare beauty. A native of southwestern Asia.

These are all for a permanent planting. They should be planted in dry, sun-baked locations. Cultivation has not modified them, they do very well in dry crannies of a rock garden, or along walks or drives that are hard barren areas throughout the summer.

Many garden lovers enjoy a new sense of the beauties of creation when they see the frills of the Parrot Tulip for the first time. They are especially suitable for cut flower arrangements.

You are going to be a heavy loser if you do not have several kinds of lilies nodding in your garden throughout the summer. Try them with delphiniums.



Depth to plant in Colorado.

A. *F. Narcissus.*

B. *C. Grape hyacinth. Snowdrop.*

D. *Lily.*

E. *Tulips.*

In general, bulbs should be planted deeper in Colorado than is usually recommended in other climates. Lilies may vary according to kind. Tulips may be planted even a foot deep if the soil is not too hard.

FOUR NEW BOOKS

In the library at Horticulture House there are books new and old. For some, the old books hold a fascination, while others want the very newest book. "All About House Plants" by Montague Free is well named. Mr. Free tells how to select, care for and propagate house plants. The book is beautifully illustrated and should be very helpful to an "indoor gardener".

In "Garden Easily" by H. K. Morse, the author has selected plants for easy gardening with ideas for their arrangement. She writes delightfully, giving many helpful suggestions to the busy person who needs the beauty of a garden.

If one wants humor in a garden book, read Dwight Farnham's, "The Embattled Male in the Garden", with the provocative sub title, "Why Women Are Queer in the Country".

"Garden Islands of the Great East" by the plant explorer, David Fairchild, will take one in imagination to the Philippines and Netherlands India in the junk, "Cheng Ho". Mr. Fairchild organized the Office of Plant Introduction in Washington and has spent many years introducing useful plants into America. This is a fascinating book.

THESE THINGS YOUR ASSOCIATION HAS DONE

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ing of better plants and the use of better horticultural practices.

Preached the gospel of better forestry practices and conservation.

In general, have attempted to co-ordinate all forestry and horticultural activities of the state for the advancement of Colorado.

With an increased membership much more may be accomplished.



Photos by U. S. Forest Service

WILDERNESS OF THE FLAT TOPS

By BENJAMIN M. WHITEHILL, *Forest Ranger*

ALMOST in the exact center of the original White River Plateau Timber Reserve, set aside by President Harrison in 1891, lies the Flat Tops Wilderness.

This area embraces 130,000 acres of national forest land, to be preserved in its natural or primitive state, and intended primarily for historical, educational and recreational benefits. Here only the most meager improvements are permitted—horse trails, fundamental camping facilities, and such administrative improvements as are necessary to maintain and protect the area. Commercial timber cutting is prohibited; and while limited grazing is permitted, it is not considered that this use will measurably affect the natural conditions of the area.

Geologically, the area is composed of a large segment of the lava cap which once covered much of this sec-

tion of Colorado, and overlays many of the recent formations. But apparently the drainage was quite well formed before the ice age which gave this area much of its present character. There are a few peaks—Trappers, Shingle, and Marvine, for example—rising above the general level of the plateau; but, in general, it is characterized by a rolling terrain dotted with potholes and small lakes, marks of the glacial period. Peculiarly, the plateau is drained in the center by the White River, from which it derives its name, on the north and east by the Yampa River, and on the south and east by the Colorado River. Since the lava is very resistant to erosion, in contrast to the sedimentary formations which it covered, high cliffs with talus slopes surround the Flat Tops. Some of these cliffs, like the Chinese Wall, rear up almost perpendicularly

a thousand feet. Many segments have been cut off the plateau, forming mesas or buttes such as Flat Top Mountain, the highest point in this section, with an elevation of 12,492 feet, overlooking the Yampa Valley. The Devil's Causeway is a very narrow neck of the plateau, which now separates the headwaters of the Williams River from those of the Bear River and thus connects a mesa with the main body of the plateau. Since it is only a few feet wide at the narrowest point and hundreds of feet down to the base of the talus slopes on both sides, only a (dare) Devil will cross, hence the name.

The cliffs form almost continuous barriers between the plateau and the stream beds or basins. Generally, ascent or descent may be made only over trails which have been located at the most advantageous breaks in the barriers. The basins, with lakes and wall-like cliffs, form the most beautiful part of the scenery. Combined with forests and meadows and viewed either from the basin floor or

from the tops of the cliffs, the panorama ends often only at the horizon in a faint blue haze. There are what could be called ten or more major basins of this type included in or adjacent to the Flat Tops Wilderness area, of which the Trappers Lake basin is probably the best known and the most beautiful. Each of these basins is different and has its own attractions.

The elevation of the wilderness area varies from about 9,500 feet on the larger streams to over 12,000 feet. Starting at 10,500 feet on the west end of the area, the plateau itself rises to the east and ends in high points, such as the above-mentioned Flat Top Mountain. Here, the snow accumulates during the long winter, which starts in October and ends in June. The unbroken snow cover at the higher elevations frequently stores over 20 inches of water in its six to ten feet of depth. Melting from May through July, and often lasting even into August, it furnishes water for domestic uses, for irrigation, and for





Tops is surprisingly luxuriant considering that it is usually June and sometimes July before most of the snow is off the ground, and it may be covered again for the winter early in October. Flowers start blooming immediately after the snow leaves, starting with the large flowered buttercup, which sticks its head up through the edges of the receding snow. The season is so short that one may find what might be considered spring, summer, and fall flowers all blooming at the same time. The more common showy flowers are the white variety of the Colorado columbine, polemonium, blue bell, forget-me-not, alpine aster (sunflower), true asters, phlox, bistort, alpine clover, violets, elephantella, and sickletop, or ramshorn lousewort, under the timber. The lucky one may find Parry's primrose in a cold rocky spring-fed stream.

The forage plants are predominated by sedges and redtop grasses with alpine timothy a conspicuous component. Mountain bunch, brome, and wheat grasses appear on south ex-

posures and at the lower elevations. Browse species are few—chiefly willow, which forms large patches in wet locations. The Flat Tops being virtual timber line, Engelmann spruce—often called timber-line spruce—is the predominant tree; with alpine fir, lodgepole pine, and Douglas-fir found at the lower elevations of the Wilderness area.

The Flat Tops Plateau, or plateaus, for the most part, are quite open, with large meadows broken with rock ridges and patches and fringes of timber affording excellent horseback riding opportunities. One who is familiar with the area need not follow the marked trails over the plateau, but may follow his inclination and ride in search of vantage points for unusual views from the cliffs or of wildlife in their native haunts. The area usually affords good elk hunting early in the big-game season, but the possibility of having to face a snow storm of major proportions must not be overlooked.

August is the ideal time to visit power development at Hoover Dam.

The vegetative cover of the Flat this area. Summer showers are generally past and insect pests few. While July and September are both good and have their advantages, snow drifts may be encountered early in July along with summer showers; and heavy frosts in September, along with

the beautiful clear days. All lakes and streams which will support fish have been stocked, and good fishing may be found throughout the area. The water here is very cold, however, and the season short; so, for the most part, feed conditions are not what we might desire and fish development is slow. But—one cannot have everything at the same time.

DON'TS

By JACK HARENBERG

DON'T go through another summer mowing around shrubs or evergreens which are set out in the middle of things in the path of your mover. Now is the time to make plans for



moving them into a position where they will be of more benefit to your foundation planting or screen. These scattered plants not only give a very ragged effect, but cause excessive maintenance.

DON'T allow the globe juniper or Mugho pine that may have been planted under a window or at your front door to grow so tall that it ob-

structs your entrance or keeps out the light. This difficulty can be avoided by two trimmings during the summer.

DON'T forget to take that snapshot of your garden to help freshen your memory as to the mistakes you made this year. A good thing to do also is to make notes of the flowers that were too tall in the front and those that were too low in the back-ground. Unless you make these records your memory is liable to slip in the spring and you will be repeating the same mistakes.

DON'T forget to trim that espalier tree if you have failed to do it during the summer. A heavy snow can do it a lot of damage, and it is only really effective when it is trimmed in the shape that it was intended.

DON'T forget to drain your pool, for freezing weather is just around the corner. This is also a good time to repair any leaks or cracks.

DON'T let the grass grow in so close to your shrubs that it is difficult to mow or trim. It is usually a good idea to leave a sufficient space in front of shrubs so that annuals and perennials may be planted.



AL COFFIN, GARDENER

BY S. R. DEBOER

As this issue of the Green Thumb goes to press we learn with regret that Al Coffin died suddenly October 22nd. It is too bad that he could not have seen this little recognition of his many years of garden work. Editor.

SOME English poet, I believe it was Byron, has said that the only true gentleman on earth is a gardener. I want to subscribe to this for if there ever was a gentleman, it is Al Coffin. I have seen him stand up for the rights of his co-workers; I have seen him hold his temper when the rest of us couldn't. I have seen his manners which would be correct in any top-notch society gathering. Of course, dear reader, Al blames his manners and tact on that one-thirty-second Mohawk Indian blood he has.



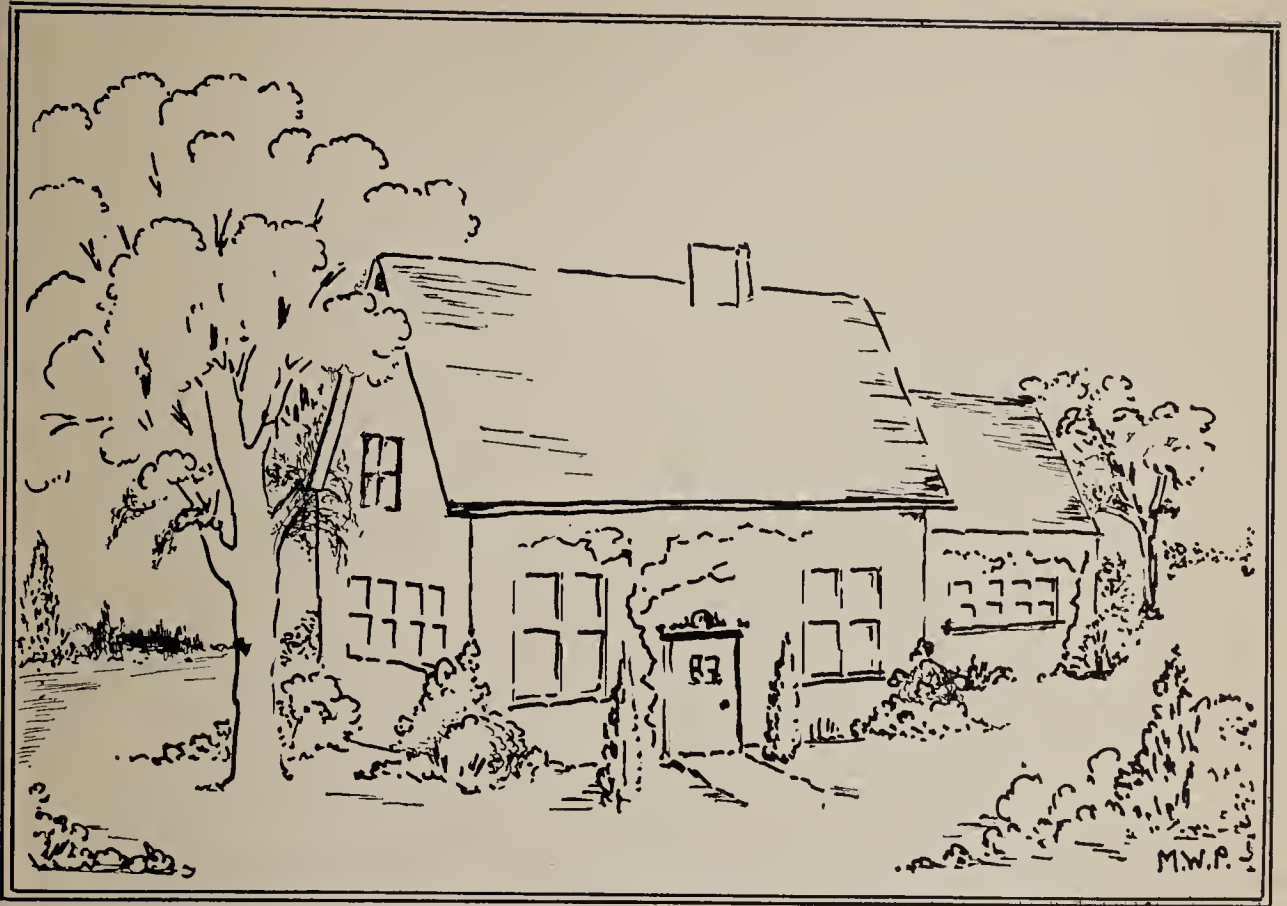
A Kansas newspaper actually claimed Al was born in Kansas on February 12, 1874, and as a Lincoln day baby, he grew up there and as "Alpha" was known as one of the speediest pitchers on the "Blue Denim" team. The name refers to the fact that the members of the team were too hard up to buy uniforms so they wore blue denim pants, home made.

What saved Al was that he came to Colorado in 1896. He became

an engineer on the Colorado Midland Railroad and they say the reason there are so many Shakespearian remarks still in existence among the common populace between Colorado Springs and Grand Junction, springs from Al's influence. At any rate, the railroad quit and Al went gardening.

I must now tell you that Al worked on many of Colorado's outstanding gardens. There are the A. C. Foster (now Temple Buell) garden, the Delos Chapell garden, the Cherry Hills Subdivision, the Al Bromfield and the Donald Bromfield gardens, many gardens in the Seventh Avenue district, the Verner Z. Reed garden, the George Brimmer garden in Cheyenne, the state parks in Rawlins, the Powell garden, the Carlton garden and many others in Colorado Springs, the parks in Ault, in Meade and in Johnstown. He worked in the Denver Parks and maintained the Washington Park flower gardens, etc.

Out of his work, Al Coffin did not gain riches which may be counted in dollars and cents but he gained something else, the friendship and respect of the men he worked with and worked for. His work has given enjoyment to many, many people. How few of us can say this, that we have contributed to the lives of others. I feel greatly honored that I have an opportunity to tell the people of our beautiful state about a man who has contributed to this beauty. I hope and trust that Al may continue to enjoy his retirement, that he may remain for many years the inspiration to the rest of us which he has been all these years.



IN MY GARDEN

By the Week-end Gardener.

As I walked out into the garden after lunch today I felt the need of a jacket. It reminded me that fall was here and winter not far away. What are some of the things needed by my garden to prepare it for winter? Those tulip bulbs that I bought should be planted before the ground freezes up. It isn't so much fun to dig through snow to plant them. I have heard that tulips should be planted deeper here. A foot seems awfully deep, but I'll try it. I should try a few narcissus and crocus also.

The garden looks rather ragged, but it may be that a little trash covering the ground will help to protect some of the more tender and shallow rooted plants. My soil is very heavy and bakes like a brick when it is dry. I believe that I will try working a little peat and sand into it and loosen it up. Of course that will not do much good deep down, but even improving the surface will help, I think. I could put a heavy dressing of manure on the garden, but I might get it too thick and burn something. Guess I'll stick to peat and leafmould. The experts say that the purpose of winter mulch is not to keep the plants warm, but to keep them frozen; or rather to prevent rapid thawing. Sounds queer, but they should know. They say to put on mulch *after* the ground is frozen.

I have noticed some plants wrapped up in burlap over winter, and the experts tell me that it is to keep the hot winter sun from drying the moisture out of them rather than to keep them warm. They say that many plants can survive in Canada which do not thrive here, because of our open hot winters. If that is the case I expect that I should put some lath or boughs on the south side of that Linden tree which was planted this spring, as I understand that a Linden has tender bark. A lattice screen to protect my little white pine should be worth the effort. My neighbors do not agree about the proper kind of winter protection for climbing roses, but I believe that I will fasten the boughs from my Christmas tree to the south of them, when I am through with the tree. That can not hurt anything and may break the sun just enough to prevent damage.

ALL-AMERICA ROSE SELECTIONS

CHAS. M. DRAGE, *Extension Horticulturist, Colorado A & M*

THE rose variety Peace, the 1946 All-America rose selection, has won a place in Colorado's rose gardens. It made its first appearance in many flower shows this season and verified all the advance claims for its beauty, elegance and adaptability.

Four hybrid teas and a floribunda — Diamond Jubilee, Nocturne, San Fernando, Taffeta and Pinkie — have been named 1948 All-America selections.

Diamond Jubilee, buff-orange colored, has flowers that grow to five and six inches; they are double and high centered.

Buds are slow to open but last well on the bush and when cut. The petals do not fade or burn as they open but rather intensify in color.

Nocturne is Cardinal Red and the plant grows quickly into a big, sturdy bush. The stems are long and the foliage is large, abundant and semi-glossy.

San Fernando is a magnificent, currant red, 30-petaled rose with a very pronounced fragrance. The stems are straight and stiff; the buds are pointed and well formed.

The Taffeta is a changeable flower and displays dozens of color combinations throughout the season. It is described as carmine rose to Begonia Rose, but varies from rose-pink to salmon or apricot. The flower carries

a pronounced fragrance and blossoms from perfectly formed buds on long stems.

Pinkie, the floribunda rose, is entirely different from any other rose variety now in existence. Each bud grows on an individual stem long enough to cut for vase arrangements.

The flowers themselves are a dainty pink and when fully open are about two inches across. Pinkie flowers almost continuously from early spring until late fall.

The glossy foliage and the tendency to shed old flower petals cleanly adapts this rose for use as a border or dwarf hedge plant.

Roses selected as All-America have been grown and exhaustively tested for two years in 18 trial gardens located throughout the country. The judges use a scoring system which includes among its points plant vigor, floriferousness, foliage, bud form, fragrance, disease resistance, color, habit, substance, flower form, and length and strength of stems.

— ♦ —

This fall the native Aspen disappointed us by not making their usual brilliant show of color. The reason for this was a fungus growth or "Black spot" on their leaves which caused them to drop before they turned yellow. The disease was unusually bad this year because of the wet spring.





IN MY GARDEN

By the Week-end Gardener.

I have found something to do in my garden every week-end this year. Today I have a notion to get out and look around at other people's plants. I wonder what kind of a tree my neighbor has in front of his place. If it were in bloom or even leaf I might know it, but now they all look alike. Or do they? That one has rather smooth, almost silvery bark on the larger limbs. I'll bet it is a Maple—a Soft or Silver Maple—as few other kinds grow in Colorado.

Then the next tree has also rather smooth bark but it is dark brown. The limb habits as I see them against the sky are very irregular. Ah, here's a clue. A long branched thorn. It must be a Honeylocust. The next tree has dark ridged bark and has wide vase-form branching. The whole tree looks black and dirty. It must be an American elm, and the dirty effect is because of scale infestation.

The next tree has a rugged formal appearance, and I notice that the limbs are all opposite each other. Here on the ground are some objects which must be the tree's seeds. They look like tiny canoe paddles. Where have I seen a picture of some seeds like that? I know, it is an Ash.

That tree in the middle of the next lawn has a habit quite the opposite from the Ash tree. The twigs are all very slim and drooping, and the bark of the trunk is white. The white bark must indicate Birch. It is probably the Cutleaf Weeping Birch.

I believe that trees do have distinctive characteristics even in winter when all the leaves are off. I think that I could tell an American Elm, Green Ash, and Maple the next time I see one, and next week I am going to get some one who knows more trees to show me how to tell other kinds when I see them in winter.

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Narraguinnep Natural Area, George W. Kelly.....	July *12	VINES:	
Gothic Botanical Trip, George W. Kelly.....	Sept. *8	Vines, George W. Kelly.....	Jan. *8
Denver Parks Flower Trail, S. R. DeBoer.....	Sept. *17	WILDERNESS AREAS:	
Nature Trips, Alice Wood.....	Nov. 11	We Need Wilderness, Sigurd Olson	May 20
		National Forest Wilderness Areas, L. C. Shoemaker.....	May *22
		Narraguinnep Natural Area, George W. Kelly.....	July *12
		Wilderness of the Flat Tops, Benj. M. Whitehall.....	Nov. *24

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Here are some ideas worth thinking about.

Mulching At Malabar

By LOUIS BROMFIELD

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THE question of mulching as opposed to open cultivation has been answered for us. We at Malabar are of the opinion that mulching is for very nearly every category of horticulture and agriculture definitely superior to cultivation.

It has long been our practice to use mulch rather than cultivation in the garden given to the growing of small vegetables for the daily consumption and winter use of about thirty-five people. Once the seeds have germinated or the plants are set out, it is our practice to mulch heavily with straw, old hay or even weed clippings or whatever material is available. The results have been universally excellent from many points of view.

The mulching is a great labor saver. Once the mulch is applied only the stoutest weeds find their way through the mulch and these are of such a coarse quality and size that they are easily pulled out (especially since the mulch keeps the soil loose and moist) and with the earth shaken from their roots they are left on top of the mulch to add their contribution of humus and nitrogen when later chopped in or plowed under. Mulching eliminates all further cultivation, thus saving much time and back-breaking work.

The mulch keeps the soil more loose than if it were cultivated and infinitely more moist than when the deep soil is protected from sun and wind by only the usual dust mulch provided by cultivation. The mulch of organic material also acts as a non-conductor of both sun, heat and wind, and the temperature of the earth beneath is always several degrees cooler than in soil that is cultivated. This condition, together with

moisture, promotes the activity of the bacteria in the soil so necessary to proper health and growth, and also keeps active the earth worms which in hot and dry ground take to lower depths, usually below the reach of most vegetable roots, where the earth is cooler and more moist.

The mulch prevents all erosion and any loss of rain water by run-off. It is an absolute check. We also found that in vegetables subject to blight diseases the blight virtually disappeared. One of the largest commercial vegetable growers in the country, a friend of mine, told me that in his experience there were two reasons for this disappearance of blight (a) that the cool, moist, loose condition of the soil in which the plants were growing induced greater health and resistance in the plants themselves; (b) that in a heavy rainfall the drops, falling upon the mulch were absorbed by the mulch without any "splashing" action. When the heavy rain drops fall upon dry cultivated soil, they were shattered in a splashing action which threw the water upward, scattering the spores of the blight from infected ground upward on to the leaves of the plant.

I believe that there is an actual superiority in the taste of mulched vegetables over those which are cultivated. This is especially true in our experience with lima beans, cantaloupe, sweet corn and heavily mulched asparagus.

The practice of mulching increases the resistance to most insects. Although scientists have by no means discovered all there is to know regarding the resistance of healthy plants to insect attack, it seems clear to me that healthy plants, grown in moist cool soil, in which the essential elements and trace minerals are present, provide their own insecticides.



Hill Japanese Juniper—*Juniperus procumbens nana*



Mugho Swiss Mountain Pine—*Pinus mugo mughus*



Dwarf Japanese Yew—*Taxus cuspidata nana*



Pfitzer Chinese Juniper—*Juniperus chinensis pfitzeriana*



